PSYCH 367
PERCEPTION

Online Labs

Learning Outcomes

In completing the online labs, you will:

1. Engage in a unique experiential learning activity that is beyond the scope of the lectures.
2. Understand how empirical research findings relate to theoretical concepts in perception.
3. Develop your scientific research, data visualization, digital literacy, and written communication skills, which are important abilities that are highly valued by employers and post-graduate schools.

Submitting

You will go to different Open Educational Resources (free!) websites to do the lab experiments, and collect data on your performance. Each lab has questions that you must answer based on the lab and related lecture/textbook material. Your lab must be submitted as a single file using eClass (PDF preferred). (eClass will only accept these document file types: Microsoft Word (.docx), Portable Document Format/Adobe Acrobat (.pdf), OpenDocument Text/LibreOffice (.odt), and Google Docs (.gdoc). NOTE: Apple Pages (.pages) files are **not** accepted.) Use complete sentences; do not use point form. It is your responsibility to ensure that your lab has been properly submitted. You should receive a confirmation email from eClass as soon as your submission is successful. Labs submitted without appropriate data (when required) will be considered incomplete, and will be penalized for lateness if not submitted with data on time.

Marks

Each lab consists of an interactive perception experiment, done on your own time. Depending on the lab, you must include a graph, table, or other data (e.g., a screenshot) of your results, and answer a number of questions for marks. Marks are awarded based on the completeness, relevance, and specificity of your answers. If your answer is incomplete, irrelevant, vague, or is lacking detail, marks will be deducted. Partial marks are given at the discretion of the teaching assistant. Note that each lab is not equally weighted towards your final grade.

You do **not** need to refer to any external sources in your lab; however, you are encouraged to read the textbook for background information on each lab. Any external sources *must* be correctly cited and referenced in APA style.

Due Dates & Late Policy

Each lab must be submitted by the **end of class time** (not at midnight) on the day in which it is due, or it will be considered late. Late labs will lose 1 mark per 24-hour period, starting immediately after class is over. That is, if you submit your lab 1 minute after class is over, you will lose 1 mark. If you submit it 23 hours and 59 minutes after class is over, you will still lose only 1 mark. But if you submit it 24 hours and 1 minute after class is over, you will lose 2 marks.

⚠ If you edit or make any changes to your eClass submission after the due date, you will receive a **late penalty**.

🚫 Do **not** email labs to the instructor or the TA. Late (or early) labs may be submitted via eClass. However, after seven days past the due date, you will no longer be able to submit your lab online. If you have exceptional extenuating circumstances, please contact the instructor.

Alternate Assignment

If you have a compelling reason why you cannot do the online labs, an alternate assignment may be provided. You must make arrangements with the instructor **before** lab #1 is due.

Technical Support

"Technical problems" will not be accepted as an excuse for a late or incomplete lab. However, should an online lab be unavailable (e.g., the website, web page, or lab is taken down by its owners), the weight of that lab will be added to your final exam.

eClass Support has eClass for Students tutorials, ranging from System Setup to Submitting Assignments. For help with eClass, see the IST eClass support knowledgebase or contact IST eClass support. For other IT problems, contact IST Assistance.

⚠ It is **strongly** recommended that you make **backups** of your answers to each lab (and your data). "My computer crashed" is not an acceptable excuse for a missing, incomplete, or late lab. Google Drive is your friend.

How To Take a Screenshot

Some labs present a graph or a summary of your data, but do not allow you to access your raw data. In that case, you will be asked to take a screenshot of the results on your device's screen, and include them in your submission as proof that you completed the lab. These websites will help you take a screenshot:

- take-a-screenshot.org -- has how-to instructions for Windows, Mac, ChromeOS, Android, iOS, and Linux
- Keyboard shortcut for print screen -- instructions for Windows
- Open Snipping Tool and take a screenshot -- instructions for the Snipping Tool in Windows 10 or 11
- How to take a screenshot on your Mac -- instructions from Apple Support

How to Make a Graph

For some labs, you will have to make a graph based on data in a CSV spreadsheet file. Here are some instructions:

- Create a chart from start to finish (Microsoft Excel)
- How to Make a Line Graph in Excel video
- Inserting Charts (LibreOffice Calc)
- Add & edit a chart or graph (Google Sheets)

The Fine Print

The University of Alberta is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Code of Student Behaviour and avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence.

Academic dishonesty is a serious offence and can result in suspension or expulsion from the University. This resource from Student Conduct and Accountability, and the University of Alberta Library can help:

- Academic Integrity: Introduction to Academic Culture - videos on citing, quoting, summarizing, and paraphrasing
- How to Avoid Plagiarism - plagiarism definition, and tips for avoiding plagiarism
- Citing, Quoting, Paraphrasing & Summarizing - how-to document that compares and contrasts them
- APA Citation Style (7th edition) - explains how to cite and reference sources for psychology
- Don't Do It (Cheating & Plagiarism) - Faculty of Science document on academic misconduct and resulting penalties

Online Labs

Online Lab #1: Signal Detection (7 marks) -- due Monday, September 18

🎯 Learning Outcomes

- Participate in an online experiment and collect data on your sensitivity to tilted lines.
- Interpret your data in terms of signal detection theory.
- Apply your knowledge of signal detection.

📖 Background

- read Appendix C: The Signal Detection Approach in the textbook

📝 Instructions

- go to the website for this lab (called Sensation & Perception Activity 1.1 - Psychophysics):
  https://cdn.sinauer.com/wolfe4e/wa01.01.html
- read the Introduction and Instructions, then click Start or Restart Experiment to begin the experiment
- this experiment has three stimulus conditions: 0° stimulus tilt (catch trial), 1° stimulus tilt, 3° stimulus tilt
- do 100 trials in total
- take a screenshot of your results
- data given: correct rejection rate for 0° stimulus tilt, hit rate for 1° stimulus tilt, & hit rate for 3° stimulus tilt (your results may not be rounded correctly; just work with what you're given)
- convert your false alarm rate and both hit rates to proportions or decimals (e.g., 75% would be 0.75)
- the calculator below will give you *d'* for each of the two stimulus tilt conditions:
  https://eshedmargalit.com/dprime_calculator/
- first, enter your 1° hit rate and the correct rejection rate
- then repeat using your 3° hit rate and correct rejection rate

📈 Data

- include screenshot of your results in your submission; screenshot contains correct rejection rate, hit rate for 1° stimulus tilt, and hit rate for 3° stimulus tilt

❓ Questions

a) What are the independent and dependent variables in this lab? (If you need a refresher on these concepts, see this page on research designs.) (**2 marks**)

b) Which condition (1° or 3° tilt) should produce the larger *d'*, and why? Give your actual *d'* values. How is the false alarm rate calculated? (**3 marks**)

c) A good friend of yours just had a baby, and she is extremely worried about the health of the baby. When detecting if the baby is crying or not, what error would she make more often, false alarms or misses, and why? (**2 marks**)

Online Lab #2: Mapping Your Blind Spot (6 marks) -- due Monday, October 2

🎯 Learning Outcomes

- Participate in an online experiment to collect data on the location of your retinal blind spot.
- Interpret your data in terms of your knowledge of the retinal blind spot.
- Apply your knowledge of the blind spot.

📖 Background

- read section 3.1 Light, the Eye, and the Visual Receptors (pp. 40-43) in the textbook

📝 Instructions

- go to the website for this lab (called Blind-spot visualization tool):
  https://avtanski.net/projects/blindspot/
- read the Instructions, then click the 300 button to begin the experiment
- conditions: first test your left eye (close your right eye or keep it covered)
- when done, right-click and "Save image as..." to save an image of your results
- then test your right eye

📈 Data

- include both images of blind spot locations in your submission (one image for each eye); images show locations that were detected (dark green dots) and not detected (bright red dots)

❓ Questions

a) Describe the location of your blind spot in relation to the fixation point for your left eye, and for your right eye. (**1 mark**)

b) What is the cause of your blind spot? Give four reasons why we are not usually aware of it. (**3 marks**)

c) Based on your knowledge of the visual system and the presentation of visual stimuli, describe any two different factors in this experiment that you could change, which would systematically affect the size of a person's blind spot as measured in this experiment. Be sure to explain how each factor would affect the measured size of the blind spot. We are not looking for factors that would affect the precision or reliability of the measurement. Hint: these factors may explain differences in results obtained from different observers. (**2 marks**)

Online Lab #3: Visual Search (10 marks) -- due Monday, October 16

🎯 Learning Outcomes

- Participate in an online visual search experiment, and collect data on your performance.
- Develop your data visualization skills by creating a line graph.
- Interpret your data in terms of your knowledge of feature integration theory.

📖 Background

- read pages 126-127 on Feature Integration Theory in the textbook

📝 Instructions

- go to the website for this lab (called Sensation & Perception Activity 7.2 - Visual Search): https://cdn.sinauer.com/wolfe4e/wa07.02.html
- read the Introduction and Instructions, then click START to begin the experiment
- this experiment has 2 × 2 conditions: feature or conjunction search task (do **not** use serial or dynamic); and 4 or 16 distractors
- do at least 50 trials of each condition (50 × 4 = 200): after you have done at least 100 trials of feature search, click conjunction search and do at least 100 trials
- take a screenshot of your results

📈 Data

- include screenshot of your results in your submission; screenshot contains Avg. RT (mean reaction time) for each condition, and slope for each search task
- create a line graph of items (X-axis) vs. reaction time (Y-axis): one curve for each search task (put both curves on the same graph; be sure to include both axes, titles and units for each axis, and a legend) (**3 marks**)

❓ Questions

a) What are the independent and dependent variables in this lab? (**2 marks**)

b) Which search task, feature or conjunction, should have the lower overall RT, and why? Which search task, feature or conjunction, should have the higher overall RT, and why? (**2 marks**)

c) According to Feature Integration Theory, what should the slope of each search task look like, and why? What did you actually find? (**3 marks**)

Online Lab #4: Müller-Lyer Illusion (8 marks) -- due Monday, October 30

🎯 Learning Outcomes

- Participate in an online experiment to collect data on your susceptibility to the Müller-Lyer illusion.
- Develop your statistical literacy skills by performing a correlation on your data.
- Develop data visualization skills by creating a scatter plot or line graph of your data.
- Apply your knowledge of visual illusions.

📖 Background

- read section 10.8 Illusions of Depth and Size (pp. 252-255) in the textbook

📄 Instructions

⚠ **Note**: If you encounter a "**#null**" error, it is because you have not created an APA account.

- go to the APA Online Psychology Laboratory website: https://opl.apa.org/index.html
- click STUDENT LOGIN, then CREATE AN ACCOUNT
- click on the Müller-Lyer Illusion icon and enter the class ID: **217141**, then click Launch Experiment
- click on the DESCRIPTION tab and read through all of the information
- click on the EXPERIMENT tab, then click the START button to begin the experiment
- this experiment has 11 conditions, based on the angle of the fins; each condition is presented twice
- do all 22 trials
- click the SAVE DATA button
- to download your data in CSV format, click the Data icon on the left side: 🗄
  then in the **Experiment** drop-down menu, select "Müller-Lyer Illusion," then in the **Class(es)** drop-down menu, select "University of Alberta - PSYCO367 (217141)," and then click the Get Report button
- you will have to look through the file to find your data, which is what you will use for this lab (look for the row with your ProfileID)

📈 Data

- your mean adjustment error for each fin angle is provided in a CSV spreadsheet file (do **not** submit this file)
- create a scatter plot or line graph of fin angle (X-axis) vs. mean adjustment error (Y-axis); be sure to include both axes, titles and units for each axis (**2 marks**)

❓ Questions

a) Calculate the Pearson correlation coefficient between fin angle and mean adjustment error, using an online calculator like https://www.statskingdom.com/correlation-calculator.html (or by using the CORREL function in Microsoft Excel or LibreOffice Calc). Give your correlation. Explain what you expect the correlation coefficient to be and why. (**3 marks**)

b) Based on your understanding of the Müller-Lyer illusion, what do you expect the mean adjustment error to be for a fin angle of 90, and why? (**2 marks**)

c) Your psychology instructor is teaching you about perceptual illusions. He takes an ordinary pencil and passes it around the room so everyone can feel that it is made of solid wood. Then he wiggles it between his fingers and it appears that it is bending like rubber. Why would this phenomenon be considered an illusion? (**1 mark**)

⚠ **Note**: The way the data are handled in this lab can be a bit confusing. Here's OPL's explanation:

If the illusory line is longer than the adjusted line, it means the participant has made the adjustable line short, indicating that the participant sees the illusory line as shorter than it actually is; it results in a positive difference (i.e., Illusory minus Adjustable). The negative value in the graph reflects the fact that the adjusted line is shorter than it should be to match the illusory line. The participant's judged length is less than the

illusory line, so the error is negative. This is what we would expect for the acute angles (e.g., 15 degrees, 30 degrees, etc.). The Y-axis reflects how much smaller the adjusted line is compared to what it should be.

In the OPL module, a positive difference between the length of the illusory line and the adjustable line indicates a negative value with respect to the magnitude of the error; that is, the adjustable line is negative in length compared to the illusory line. The problem is having to mentally convert a positive arithmetic difference into a negative magnitude of error.

Online Lab #5: Size Constancy (7 marks) -- due Friday, November 10

Learning Outcomes

- Participate in an online experiment to collect data on your perception of size constancy.
- Apply your knowledge of psychophysical methods and visual depth cues.

Background:

- read pages 231-234 on Pictorial Cues, and pages 250-252 on Size Constancy in the textbook; the ISLE website also provides a Size Constancy Illustration:
  https://isle.hanover.edu/isle2/Ch07DepthSize/Ch07SizeConstIllus.html
- for a brief discussion of the Point of Subjective Equality (PSE), see the lecture notes on Psychophysical Methods and TSD; the ISLE website also has a PSE exercise:
  https://isle.hanover.edu/isle2/Ch02Methods/Ch02MethodOfAdjustmentPSE_evt.html

Instructions

- go to the website for this lab (the Interactive Sensory Laboratory Exercises (ISLE) 7.2 (b.2)):
  https://isle.hanover.edu/isle2/Ch07DepthSize/Ch07SizeConstancyExpMOA.html

Part I: Control Condition (no depth cues)

- read the information in the Background and Instructions tabs, then go to the Experiment tab and click the Start button
- do all 20 trials
- click the Show PSE button; take a screenshot of your results (you may also download your data)

Part II: Experimental Condition (depth cues)

- go to the Stimulus Settings tab, click the New Study button, then click the Reset button
- click the check boxes and adjust the settings to the following:
  - ☑ Relative Height = 0.10
  - ☑ Linear Perspective = 0.00
  - ☑ Texture Gradient = 1.00
  - ☑ Atmospheric Persp. = 0.00
  - ☑ Shadow = 0.00

(do **not** check the Use Binocular Disparity check box)

- go to the Experiment tab and click the Start button to run the experiment again with changed settings
- do all 20 trials
- click the Show PSE button; take a screenshot of your results (you may also download your data)

Data

- include screenshots of your results in your submission; screenshots contain graphs of your estimates of relative circle size in each part, and PSE

Questions

a) What are the independent and dependent variables in this lab? (**2 marks**)

b) What do you expect the PSE (point of subjective equality) to be in each part, and why? What did you actually find? (**3 marks**)

c) What additional pictorial depth cue could you add to this experiment? Explain how you would apply it in this experiment. (**2 marks**)

⚠ **Note**: Some of the stimulus settings are counterintuitive. For example, a Texture Gradient setting of 20.00 gives no depth cues, but a setting of 1.00 gives the strongest depth. For others (e.g., Relative Height), a setting in the middle (0.5) gives no depth cues. The default settings (Part I above) produce no depth cues.

Online Lab #6: Frequency Response of the Ear (6 marks) -- due Monday, November 20

Learning Outcomes

- Participate in an online experiment to collect data on the frequency response of your auditory system.
- Apply your knowledge of auditory perception and sensitivity.

Background

- read pages 263-270 on Hearing in the textbook (from the start of the chapter to the end of the Threshold and Loudness section)

Instructions

Note: For best results, you should wear headphones while doing this lab, and do the lab in a quiet location.

Troubleshooting: If you cannot hear any sound, try using Mozilla Firefox. Alternatively, go to the ISLE homepage (https://isle.hanover.edu/isle2/) and navigate to the lab by clicking on "10. The Auditory System", then clicking on "ISLE 10.5. Frequency Response of the Ear".

- go to the website for this lab (the Interactive Sensory Laboratory Exercises (ISLE) 10.5.): https://isle.hanover.edu/isle2/Ch10AuditorySystem/Ch10FreqEar2.html
- read the information in the Background and Instructions tabs, then go to the Illustration tab
- first, click the Adjust button and adjust the intensity (-/+) until the sound is just barely audible (you may also need to change your device's volume level), then click the Done button
- next, select a frequency of 125 Hz and click the Play button, counting the number of "Steps" or times you hear the tone played, and enter your response; do this for each frequency
- take a screenshot of your results (you may also download your data)

Data

- include screenshot of graph of threshold intensity detected vs. frequency

Questions

a) What are the independent and dependent variables in this lab? **2 marks**)

b) Typically, healthy young adult observers with normal hearing cannot detect all of the 10,000 Hz sounds (whereas they are able to detect more of the sounds in the 2,000-4,000 range). Why does this occur? (**2 marks**)

c) You tell your mom about this lab, and she decides to try it herself on her computer. You and your mom compare your results for this lab. You were not able to detect all steps of each tone, but your mom was able to detect every step of each frequency. Give two different possible reasons for this, aside from any form of noise-induced hearing loss or damage. (Hint: what things should you check to determine why your mom did better than you?) (**2 marks**)

Online Lab #7: Perfect Pitch (6 marks) -- due Monday, December 4

🎯 **Learning Outcomes**

- Participate in an online experiment to assess your perfect (absolute) pitch ability.
- Interpret your results in terms of the criteria for absolute pitch.
- Apply your knowledge of psychophysical methods.

📖 **Background:**

- read page 270 on Pitch in the textbook for background information, and also this web page:
  https://www.musical-u.com/learn/about-perfect-pitch/
- also review section 1.5 Measuring Perception in the textbook on psychophysical methods

📝 **Instructions:**

⚠ **Note**: For best results, you should wear headphones 🎧 while doing this lab, and do the lab in a quiet location.

- go to the website for this lab (Tone Savvy Perfect Pitch Test):
  https://tonesavvy.com/music-practice-exercise/218/absolute-perfect-pitch-test-ear-training/
- in the **Notes** drop-down menu, select C Scale (C, D, E, F, G, A, B)
- in the **Questions** box, select 70 (be aware that you may not hear each note the same number of times)
- click the Start Quiz button
- when you are done, take a screenshot of your results

📈 **Data:**

- include screenshot of your results in your submission, which contains number completed (trials), errors, and score (percent correct); for this lab, you will just need your score

❓ **Questions:**

a) What are the independent and dependent variables in this lab? (**2 marks**)

b) What was your percentage score on the test? According to the lectures, what would your score need to be in order to be considered perfect pitch? (**2 marks**)

c) What psychophysical method is being used to present the stimuli in this experiment? Explain your choice. (**2 marks**)