

# Proseminar in Cognitive Psychology

## Module 2: Perceptual Processes

**PSYC 5665-001**  
**Lewis O. Harvey, Jr.**

**Fall 2020**  
**Wednesday, 9:00–10:40**  
**Muenzinger E113**



Thatcher Illusion (Thompson, 1980)

This course is one module of the six-module proseminar series for first- and second-year graduate students. It is organized around original papers, student presentations, and quantitative data analyses.

### **Goals**

1. **Learn About Fundamental Issues and Methods:** We will read and discuss published papers about the processing of sensory information and the methods used to draw conclusions;
2. **Develop Presentation and Critical Thinking Skills:** You will make critical presentations of assigned journal articles and lead critical discussions;
3. **Sharpen Analytic Skills:** You will learn advanced methods of data analysis, graphical representation and manuscript preparation using R, RStudio and R Markdown to promote Open Science and Reproducible Research.

We will read and discuss papers that address critical issues on these topics. One person will be selected in advance to present each paper and distill the basic ideas for the rest of the class. This individual will also provide 2-3 lead-off questions for the whole class to discuss. There will also be a series of data analysis assignments to give you practical knowledge of techniques used to measure sensory and perceptual processes. Presentations and class participation will count for 70% of the grade while a take-home exam will count for the remaining 30%.

You may want to refer to an undergraduate text such as by Jeremy Wolfe (Wolfe et al., 2018). There are copies around the department that you can borrow if need be. The seventh edition of the APA Publication Manual (American Psychological Association, 2020) is an indispensable book for all graduate students and researchers who are writing scholarly manuscripts. You should get one early in your graduate career.

Reading Assignments

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1. <b>26 August 2020, Wednesday</b> (Garner et al., 1956)	<b>Introduction</b>
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2. <b>2 September 2020, Wednesday</b> (Hecht et al., 1942)	<b>Psychophysical Methods</b>
3. <b>9 September 2020, Wednesday</b> (Swets et al., 1961)	<b>Psychophysical Methods</b>
4. <b>16 September 2020, Wednesday</b> (Axelsson et al., 2018)	<b>Signal Detection Theory</b>
5. <b>23 September 2020, Wednesday</b> (Wixted & Mickes, 2014)	<b>Signal Detection Theory</b>
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6. <b>30 September 2020, Wednesday</b> (Stevens, 1961)	<b>Unidimensional Scaling</b>
7. <b>7 October 2020, Wednesday</b> (Borg et al., 1967)	<b>Unidimensional Scaling</b>
8. <b>14 October 2020, Wednesday</b> (Shepard, 1974)	<b>Multidimensional Scaling</b>
9. <b>21 October 2020, Wednesday</b> (Kriegeskorte et al., 2008)	<b>Multidimensional Scaling</b>
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10. <b>28 October 2020, Wednesday</b> (Blakemore & Campbell, 1969; Campbell & Robson, 1968)	<b>Visual Mechanisms</b>
11. <b>4 November 2020, Wednesday</b> (McMahon & MacLeod, 2003)	<b>Visual Mechanisms</b>
12. <b>11 November 2020, Wednesday</b> (Ninio & Stevens, 2000; Schiller & Carvey, 2005)	<b>Visual Mechanisms</b>
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13. <b>18 November 2020, Wednesday</b> (Plomp, 1976)	<b>Auditory Mechanisms</b>
14. <b>25 November 2020, Wednesday</b> (Plomp & Levelt, 1965)	<b>Auditory Mechanisms</b>
15. <b>2 December 2020, Wednesday</b> (Hurley et al., 2018)	<b>Auditory Mechanisms</b>
16. <b>13 December 2020, Sunday</b>	<b>Take-Home Final Exam Due</b>

## Class Presentations

When leading a discussion of a research paper in class it is helpful to emphasize the answers to five questions:

1. ***What question(s) was (were) the author(s) trying to answer?***  
Many times authors of papers unnecessarily limit the scope of their paper or base their experiment on a false premise. An example is the question “does recognition memory have one or two processes?” This question assumes that one of these two possibilities is correct and ignores the possibility that more than two processes are involved. A much broader question would be “How does recognition memory work?” When you discuss a paper, do not take the author’s question at face value; rephrase it in your own terms.
2. ***What did the author(s) do to answer the question?***  
This topic involves method and procedure. Focus on the parts of the procedure that are important and ignore details that are irrelevant. The central idea of operationism (Bridgman, 1927; Garner et al., 1956) is that concepts have no scientific meaning beyond the operations used to measure them. For example, the authors may have measured the reaction time of observers making judgments about whether or not a test face had been previously seen. Distinguish what is actually measured (reaction time) from the interpretation the authors put on it (e.g., confidence or speed of processing). In other words, distinguish what the authors actually did from what they think they did.
3. ***What did the author(s) find?***  
In an APA style paper, this question is answered in the results section. The results are the actual data either in raw form or summarized by means that allow comparing relevant experimental conditions. For example, the results might be the mean reaction time for testing in the morning and mean reaction time for testing in the afternoon.
4. ***What did the author(s) conclude?***  
This question is handled in the discussion section of the paper and is the part that deserves careful consideration. Do the results, combined with what the authors actually measured, justify the conclusions? One should feel free to contradict the authors if their conclusions are not justified.
5. ***What is your evaluation?***  
Give us your opinion and evaluation of the paper.

**Statements Required by  
Associate Vice Chancellor for Undergraduate Education**

## **Classroom Behavior**

Both students and faculty are responsible for maintaining an appropriate learning environment in all instructional settings, whether in person, remote or online. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. For more information, see the policies on [classroom behavior](#) and the [Student Code of Conduct](#).

## **Requirements for COVID-19**

As a matter of public health and safety due to the pandemic, all members of the CU Boulder community and all visitors to campus must follow university, department and building requirements, and public health orders in place to reduce the risk of spreading infectious disease. Required safety measures at CU Boulder relevant to the classroom setting include:

- maintain 6-foot distancing when possible,
- wear a face covering in public indoor spaces and outdoors while on campus consistent with state and county health orders,
- clean local work area,
- practice hand hygiene,
- follow public health orders, and
- if sick and you live off campus, do not come onto campus (unless instructed by a CU Healthcare professional), or if you live on-campus, please alert [CU Boulder Medical Services](#).

Students who fail to adhere to these requirements will be asked to leave class, and students who do not leave class when asked or who refuse to comply with these requirements will be referred to [Student Conduct and Conflict Resolution](#). For more information, see the policies on [COVID-19 Health and Safety](#) and [classroom behavior](#) and the [Student Code of Conduct](#). If you require accommodation because a disability prevents you from fulfilling these safety measures, please see the “Accommodation for Disabilities” statement on this syllabus.

Before returning to campus, all students must complete the [COVID-19 Student Health and Expectations Course](#). Before coming on to campus each day, all students are required to complete a [Daily Health Form](#). In the case of in-person classes, you may be

reminded of the responsibility to complete the [Daily Health Form](#) and given time during class to complete it.

Students who have tested positive for COVID-19, have symptoms of COVID-19, or have had close contact with someone who has tested positive for or had symptoms of COVID-19 must stay home and complete the [Health Questionnaire and Illness Reporting Form](#) remotely. Check with individual faculty members in the event that you become sick or quarantined, as different faculty may have different procedures in place with regard to absences due to illness or quarantine. FERPA privacy laws ensure that students are not required to state the nature of their illness when alerting faculty.

## **Accommodation for Disabilities**

If you qualify for accommodations because of a disability, please submit your accommodation letter from Disability Services to your faculty member in a timely manner so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities in the academic environment. Information on requesting accommodations is located on the [Disability Services website](#). Contact Disability Services at 303-492-8671 or [dsinfo@colorado.edu](mailto:dsinfo@colorado.edu) for further assistance. If you have a temporary medical condition, see [Temporary Medical Conditions](#) on the Disability Services website.

## **Preferred Student Names and Pronouns**

CU Boulder recognizes that students' legal information doesn't always align with how they identify. Students may update their preferred names and pronouns via the student portal; those preferred names and pronouns are listed on instructors' class rosters. In the absence of such updates, the name that appears on the class roster is the student's legal name.

## **Honor Code**

All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the Honor Code. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access to academic materials, clicker fraud, submitting the same or similar work in more than one course without permission from all course instructors involved, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code ([honor@colorado.edu](mailto:honor@colorado.edu); 303-492-5550). Students found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code as well as academic sanctions from the faculty member. Additional information regarding the Honor Code academic integrity policy can be found at the [Honor Code Office website](#).

## **Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation**

The University of Colorado Boulder (CU Boulder) is committed to fostering an inclusive and welcoming learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct (harassment, exploitation, and assault), intimate partner violence (dating or domestic violence), stalking, or protected-class discrimination or harassment by members of our community. Individuals who believe they have been subject to misconduct or retaliatory actions for reporting a concern should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127 or [cureport@colorado.edu](mailto:cureport@colorado.edu). Information about the OIEC, university policies, [anonymous reporting](#), and the campus resources can be found on the [OIEC website](#).

Please know that faculty and instructors have a responsibility to inform OIEC when made aware of incidents of sexual misconduct, dating and domestic violence, stalking, discrimination, harassment and/or related retaliation, to ensure that individuals impacted receive information about options for reporting and support resources.

## **Religious Holidays**

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. For each class, check with your faculty member in advance so that you are aware of their specific requirements for accommodating religious observances.

See the [campus policy regarding religious observances](#) for full details.

## References

- American Psychological Association. (2020). *Publication Manual of the American Psychological Association* (7th ed.). American Psychological Association.
- Axelsson, J., Sundelin, T., Olsson, M. J., Sorjonen, K., Axelsson, C., Lasselin, J., & Lekander, M. (2018). Identification of acutely sick people and facial cues of sickness [10.1098/rspb.2017.2430]. *Proceedings of the Royal Society B: Biological Sciences*, 285(1870).  
<http://rspb.royalsocietypublishing.org/content/285/1870/20172430.abstract>
- Blakemore, C., & Campbell, F. W. (1969). On the existence of neurones in the human visual system selectively sensitive to the orientation and size of retinal images. *Journal of Physiology (London)*, 203(1), 237-260.
- Borg, G., Diamant, H., Ström, L., & Zotterman, Y. (1967, September 1, 1967). The relation between neural and perceptual intensity: a comparative study on the neural and psychophysical response to taste stimuli. *The Journal of Physiology*, 192(1), 13-20.
- Bridgman, P. W. (1927). *The Logic of Modern Physics*. Macmillan.
- Campbell, F. W., & Robson, J. G. (1968). Application of Fourier analysis to the visibility of gratings. *Journal of Physiology*, 197(3), 551-566.
- Garner, W. R., Hake, H. W., & Eriksen, C. W. (1956). Operationism and the concept of perception. *Psychological Review*, 63(3), 149-159.
- Hecht, S., Shlaer, S., & Pirenne, M. H. (1942). Energy, quanta, and vision. *Journal of General Physiology*, 25(6), 819-840.
- Hurley, B. K., Fink, L. K., & Janata, P. (2018). Mapping the dynamic allocation of temporal attention in musical patterns. *Journal of Experimental Psychology: Human Perception and Performance*, 44(11), 1694-1711.  
<https://doi.org/10.1037/xhp0000563>



- Kriegeskorte, N., Mur, M., & Bandettini, P. A. (2008, 2008-November-24). Representational similarity analysis - connecting the branches of systems neuroscience [Original Research]. *Frontiers in Systems Neuroscience*, 2, 1-24. <https://doi.org/10.3389/neuro.06.004.2008>
- McMahon, M. J., & MacLeod, D. I. A. (2003). The origin of the oblique effect examined with pattern adaptation and masking. *Journal of Vision*, 3(3), 230-239. <https://doi.org/10.1167/3.3.4>
- Ninio, J., & Stevens, K. A. (2000, October 1, 2000). Variations on the Hermann Grid: An Extinction Illusion. *Perception*, 29(10), 1209-1217. <https://doi.org/10.1068/p2985>
- Plomp, R. (1976). *Aspects of tone perception: a psychophysical study*. Academic Press.
- Plomp, R., & Levelt, W. J. M. (1965). Tonal consonance and critical bandwidth. *Journal of the Acoustical Society of America*, 38(4), 548-560.
- Schiller, P. H., & Carvey, C. E. (2005). The Hermann grid illusion revisited. *Perception*, 34(11), 1375-1397. <http://www.perceptionweb.com/abstract.cgi?id=p5447>
- Shepard, R. N. (1974). Representation of structure in similarity data: Problems and prospects. *Psychometrika*, 39(4), 373-421.
- Stevens, S. S. (1961, January 13, 1961). To Honor Fechner and Repeal His Law. *Science*, 133(3446), 80-86. <https://doi.org/10.1126/science.133.3446.80>
- Swets, J. A., Tanner, W. P., Jr., & Birdsall, T. G. (1961). Decision processes in perception. *Psychological Review*, 68(5), 301-340.
- Thompson, P. G. (1980). Margaret Thatcher: A new illusion. *Perception*, 9(4), 483-484.
- Wixted, J. T., & Mickes, L. (2014). A signal-detection-based diagnostic-feature-detection model of eyewitness identification. *Psychological Review*, 121(2), 262-276. <https://doi.org/10.1037/a0035940>

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Wolfe, J. M., Kluender, K. R., Levi, D. M., Bartoshuk, L. M., Herz, R. S., Klatzky, R. L.,  
& Merfeld, D. M. (2018). *Sensation & Perception* (Fifth ed.). Oxford University  
Press.