Psychology of Perception

Psychology 4165, Section 100

Fall 2021
Tuesday and Thursday
11:10–12:25
MUEN E417

Lewis O. Harvey, Jr. – Instructor
Andrew J. Mertens–Teaching Assistant

Thatcher Illusion (Thompson, 1980)

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Lewis O. Harvey, Jr.–Instructor
Andrew J. Mertens –Teaching Assistant

Syllabus Topics and Reading Assignments

Week 1	24 Aug 2021	Introduction		
Week 1	26 Aug 2021	Psychophysics		
Week 2	31 Aug 2021	Psychophysics	Study Guide 1	(W 1)
Week 2	2 Sep 2021	Psychophysics	Homework 1	(W 2)
Week 3	7 Sep 2021	Eye and Brain		(W 3)
Week 3	9 Sep 2021	Spatial Vision	Homework 2	(W 3)
Week 4	14 Sep 2021	Object Perception	Study Guide 2	(W 4)
Week 4	16 Sep 2021	Object Perception	Homework 3	(W 4)
Week 5	21 Sep 2021	Color Vision		(W 5)
Week 5	23 Sep 2021	Color Vision	Homework 4	(W 5)
Week 6	28 Sep 2021	Space Perception	Study Guide 3	(W 6)
Week 6	30 Sep 2021	Space Perception	Homework 5	(W 6)
Week 7	5 Oct 2021	Attention		(W 7)
Week 7	7 Oct 2021	Attention		(W 7)
Week 8	12 Oct 2021	Exam 1	Mid-Term Exam (200 points) via Canvas	
Week 8	14 Oct 2021	Motion	Study Guide 4	(W 8)
Week 9	19 Oct 2021	Hearing	Outside Reading Paper Assignment	(W 9)
Week 9	21 Oct 2021	Hearing	Homework 6	(W 9)
Week 10	26 Oct 2021	Audition	Study Guide 5	(W 10)
Week 10	28 Oct 2021	Audition	Homework 7	(W 10)

Week 11	2 Nov 2021	Music & Speech----------	---------- (W 11)
Week 11	4 Nov 2021	Music & Speech ----------Homework 8	---------- (W 11)
Week 12	9 Nov 2021	Music & Speech----------	---------- (W 11)
Week 12	11 Nov 2021	Vestibular ----------Study Guide 6	---------- (W 12)
Week 13	16 Nov 2021	Touch ----------	---------- (W 13)
Week 13	18 Nov 2021	Taste & Smell ----------	---------- (W 14 & 15)
Week 14	23 Nov 2021	FALL BREAK ----------	----------
Week 14	25 Nov 2021	FALL BREAK ----------	----------
Week 15	30 Nov 2021	Taste & Smell ----------	---------- (W 14 & 15)
Week 15	2 Dec 2021	Taste & Smell ----------	---------- (W 14 & 15)
Week 16	7 Dec 2021	Dynamic Self-Organization of Perception	
Week 16	9 Dec 2021	Summary and Review	
Week 17	10 Dec 2021	Reading Day	
Week 17	14 Dec 2021	Final Exam (300 points) --	---------- 13:30-16:00, via Canvas

- The “Homework #” notation on the syllabus indicates when homework assignments will be handed out. The homework will be due 10 days later, a week from the following Sunday.

- The “Study Guide #” notation on the syllabus indicates when study guides will be handed out. The study guides are meant to focus your reading and notetaking in the lecture portion, as well as focus on the laboratory exercises.

- Class will be held at the normal scheduled time in MUEN E417. You may not enter the classroom if you have not filled it out: https://www.colorado.edu/daily-health-form .

- Lecture 11:10–12:25 Tuesday and Thursday, Muenzinger E417

- Lab 101 12:45–15:35 Tuesday, Muenzinger D346

- Lab 102 12:45–15:35 Thursday, Muenzinger D346

Textbook for the Course

Wolfe, J. M., Kluender, K. R., Levi, D. M., Bartoshuk, L. M., Herz, R. S., Klatzky, R. L., & Merfeld, D. M. (2021). Sensation and Perception (6th ed.). New York, NY: Oxford University Press.

Note: The numbers in parentheses above refer to chapters in the Wolfe (W) text. Please read the indicated chapter before the class meeting.

Canvas

The website for the course is available through Canvas using your CU Identikey and password or directly from this URL:

http://psych.colorado.edu/~lharvey/P4165/P4165_2021_3_Fall/Main_Page_2021_Fall_PSYC4165.html

All handouts, homework assignments, study guides, and lab materials are available from this web page.

The journal readings, the lectures, and your grades are available through Canvas.

Office Hours

Name	Lewis O. Harvey, Jr.	Andrew J. Mertens
Office	MUEN D251b	MUEN D434
Hours	Mon, Tues, Thurs: 09:00–10:00 and by appointment	Monday: 11:00-12:00; in lab and by appointment
Telephone	303-492-8882	NA
email	lewis.harvey@colorado.edu	Andrew.Mertens@colorado.edu
web	http://psych.colorado.edu/~lharvey/	

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Laboratory Schedule

Section L101: 12:45–15:35 Tuesday, Room MUEN D346
Section L102: 12:45–15:35 Thursday, Room MUEN D346

1.	24 & 26 Aug 2021	Lab Orientation and Preparation
2.	31 Aug & 2 Sep 2021	Lab 1: Running Experiments and Using RStudio Lab 1: PsychoPy Data File Due at end of Lab (5 points) Lab 1: Report Due at end of Lab (5 points)
3.	7 & 9 Sep 2021	Lab 2:Analyzing Data with RStudio Lab 2: Report Due at end of Lab (20 points)
4.	14 & 16 Sep 2021	Lab 3: Create PsychoPy Experiment: Face Recognition Lab 3: Data file (.csv) uploaded at end of lab (10 points)
5.	21 & 23 Sep 2021	Lab 3: Data Analyses: Face Recognition Lab 3: Report due 23:59, Monday, 27 Sep 2021 (20 points)
6.	28 & 30 Sep 2021	Lab 4: Create PsychoPy Experiment: Stroop Effect Lab 4: Data file (.csv) uploaded at end of lab (20 points)
7.	5 & 7 Oct 2021	Lab 4: Group Data Analyses: Stroop Effect Lab 4: Report due 23:59, Monday, 22 11 Oct 2021 (30 points)
8.	12 & 14 Oct 2021	Lab 5: Form Research Project Teams Lab 5: Proposal Version 1 due at end of lab (20 points)
9.	19 & 21 Oct 2021	Lab 5: Work on Group Projects: Design experiment Lab 5: Proposal Version 2 Due at end of lab (20 points)
10.	26 & 28 Oct 2021	Lab 5: Work on Group Projects: Build Experiment
11.	2 & 4 Nov 2021	Lab 5: Work on Group Projects: Data Collection
12.	9 & 11 Nov 2021	Lab 5: Work on Group Projects: Data Collection
13.	17 & 18 Nov 2021	Lab 5: Work on Group Projects: Data Analysis
14.	23 & 25 Nov 2021	(Fall Break) Lab 5: Work on Group Projects: Prepare presentations
15.	30 Nov & 2 Dec 2021	Lab 5: Finish presentations, posters and lab reports
16.	7 Dec 2021 (Tuesday)	Group Projects: Tuesday 12:45-15:35, All Presentations (30 points)
	9 Dec 2021 (Last Class)	Group Projects: Poster and Report Completion Lab 5: Group Project Posters due (30 points) Lab 5: Final Project Reports due (60 + 30 points for discussion) Outside Reading Paper due (90 points)

Journal Readings

1.	23 Aug 2021	(Swets, 1961) (Wilson et al., 2020)
2.	30 Aug 2021	(Axelsson et al., 2018)
3.	6 Sep 2021	(Schiller & Carvey, 2005)
4.	13 Sep 2021	(Owens et al., 1994) (Wood, 2020)
5.	21 Sep 2021	(Jacobs & Nathans, 2009)
6.	27 Sep 2021	(Kaufman & Rock, 1962)
7.	4 Oct 2021	(Most & Astur, 2007) (Most et al., 2005)
8.	13 Oct 2021	(Devyatko et al., 2017)
9.	18 Oct 2021	(Keegan, 2019)
10.	25 Oct 2021	(Plomp & Levelt, 1965)
11.	1 Nov 2021	(Arnal et al., 2015)
12.	8 Nov 2021	(Held, 1965)
13.	15 Nov 2021	(Toet et al., 2020) (Guterstam et al., 2011) (Slater et al., 2010)
14.	22 Nov 2021	Fall Break
15.	29 Nov 2021	(Gelstein et al., 2011) (Gračanin et al., 2017)
16.	6 Dec 2021	Last Day of Classes

Copies of these papers are available to download for reading through Canvas using your CU IdentiKey ID. See the reference section at the end of the syllabus for complete citation information.

Conditions Under Which the Course Operates

Lecture:
There will be two exams given during the semester: one mid-term and one final examination. Both are required. There are eight homework assignments. Each homework will be handed out on a Thursday (indicated on the syllabus) and will be due on 10 days later on Sunday evening. Home works should be prepared using R Markdown with RStudio. The pdf rendering (knitting) of the markdown file for each homework must be uploaded to the appropriate Canvas Assignment Dropbox. Participation counts for 3% of your grade. It will be assessed by asking questions during class and lab, and coming to office hours.

Journal Articles Reading:
There are 19 journal articles that are assigned as part of the course. These papers will form the basis of a six to nine-page paper about experimental design and drawing conclusions from data that you will write. This paper will be due at the end of the semester, and is worth 90 points.

Laboratory:
The laboratory is not optional in PSYC 4165. There are eight graded assignments in the laboratory. The sum of the eight grades will be your laboratory grade. All lab reports will be prepared using RStudio and R-markdown so that your writing can be integrated with data analysis and graphic presentations and presented as a pdf document.

Grading:
Your final grade is computed from your exam scores, your laboratory grade, your homework grades, and the journal readings paper grade. The total possible points in the course is 1000:

200	First Examination
300	Final Examination
300	Laboratory Grade
80	Homework Grade
90	Journal Readings Grade
30	Participation
1000	Total Possible Points

Your final letter grade in the course will be assigned in the following manner. The mean score of the top three students computed as a reference score. Your letter grade is determined by comparison to this reference score:

	A > 94%,	A- 90% of reference score
B+ > 87%,	B > 83%,	B- 80% of reference score
C+ > 77%,	C > 73%,	C- 70% of reference score
D+ > 67%,	D > 63%,	D- 60% of reference score
	F < 60%	

It is therefore possible for the entire class to receive the grade of A. By the same token, it is also possible that very few people would receive an A, depending on the spread of grades across the class.

Comments About the Psychology of Perception

Why Take This Course?

There are three reasons to take this course:

1. To understand the capabilities and limitations of our perceptual experiences;
2. To sharpen your ability to critically evaluate theories of perception in light of the results of experiments;
3. To gain practical skills in the use of computers for designing experiments, for analyzing and graphing data, and for preparing written research reports.

The study of perception is the oldest part of modern psychology. It developed from trying to answer two questions posed by philosophers: "How do we know what we know?" and "Why do things appear the way they appear?" Since most of what we know about the outside world comes to us through our sensory systems, our sensory capabilities were the first to be studied extensively. Perceptions are derived from neural and psychological mechanisms that operate on sensory information. We will study the limits of our sensory and perceptual abilities and learn how to characterize the unreliability that results from these limits.

Prerequisites:

A broad understanding of the basic concepts from a general psychology course is assumed. You will be using methods of inferential statistics, such as those taught in PSYC 2111 and PSYC 3111, to evaluate the results of your experiments. A facile ability with these methods in particular and with mathematical concepts through algebra and trigonometry are required. A familiarity with calculus is helpful but is not necessary. Please work through the eight questions on the next two pages. If you find these questions very difficult and you don't even know how to find out how to answer them, you probably are not ready to take this course.

We expect you to write in a clear and grammatically correct style in this class. If you believe you will require extra help with your writing, please visit The Writing Center located in Norlin E111 and at phone (303) 735-6906. More information can be found at: http://www.colorado.edu/pwr/writingcenter.html.

You need to make a considerable commitment to do well in this class. For each credit hour of the course, you should expect to spend 3 hours on class-related activities (studying, research, writing) per week. Since the class is a four-credit course, expect to spend 12 additional hours per week outside the class and laboratory.

Student Support and Case Management (SSCM) is a great resource for students under stress from academic work and/or other life events. SSCM is not counseling or therapy; rather, SSCM case managers have the opportunity to develop close helping relationships with students while coaching them toward appropriate self-care and self-advocacy. SSCM case managers are trained to answer students' questions, discuss support options, help identify and complete next steps and ultimately, connect students to resources. If you aren't sure what office to go to, or have tried to connect with resources but haven't been able to, contact SSCM at sscm@colorado.edu or 303-492-7348 for a consult and to get connected with a case manager.

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Skills Needed for Psychology of Perception

Question 1:
Rearrange the following linear equation to solve for b: $y = a + bx$

$b =$

Question 2:
Solve the following equation for X: $y = \log(x)$

$x =$

Question 3:
Using R, compute the arithmetic mean and the standard deviation of this sample of numbers:
10.0, 9.0, 12.0, 11.0, 8.5, 13.0, 8.0, 10.0, 7.0, and 11.5:

$\mu =$

$\sigma =$

Question 4:
In an experiment, you observe the number of times six different kinds of events occur. A theoretical model makes predictions about how often these events should occur. These data are presented in the table below. Using R compute the chi-square (χ^2) statistic to test if the observed data are significantly different from the predicted data. You may assume n-1=5 degrees of freedom for the significance test.

	E1	E2	E3	E4	E5	E6
Observed Data	174.0	172.0	104.0	92.0	41.0	8.0
Predicted Data	175.5	167.8	106.5	90.4	44.3	6.5

$\chi^2 =$

Question 5:
In an experiment with two levels of an independent categorical variable you observe the following values of the dependent variable for 10 subjects (five were tested under level 1 and five under level 2). Compute the mean and standard deviation of each group and then fit a linear model to the data using R to test if there is a meaningful difference between the means of the two groups? Explain your conclusion.

Level 1

Subject	Dependent
1	8.0
2	9.0
3	7.5
4	7.0
5	8.5
Mean	
Standard Deviation	

Level 2

Subject	Dependent
6	10.0
7	9.5
8	11.0
9	9.0
10	10.5
Mean	
Standard Deviation	

Question 6:
Convert the probability 0.8413447 to a quantile score based on the cumulative distribution function (CDF) of the unit normal Gaussian distribution (a quantile is a z-score). Such a transformation is achieved by the quantile function (q <- qnorm(p) in R, where p is the probability). What is the probability that a single sample drawn from a population having a Gaussian distribution with a mean of 0.0 and a standard deviation of 1.0 will have a value of 1.959964 or greater (use pnorm(q) in R)?

$q =$

$p =$

Question 7:
Using least-squares linear regression (lm(), in R), find the y-intercept (b_0) and the slope (b_1) of the straight line, $y = b_0 + b_1 x$, that best fits this set of data:

x	1.0	3.0	5.0	7.0	9.0
y	0.98	8.73	17.0	20.9	27.4

$b_0 =$

$b_1 =$

Question 8:
Using ggplot() or the basic R plot commands, plot the data in Question 7 on a graph using linear axes. The x-axis should have a range of 0.0 to 10.0 and the y-axis should range from 0.0 to 30.

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AGREEMENTS FOR PARTICIPATING IN THE COURSE

The purpose of these agreements is to create a condition that allows all people in the class to get maximum value from the course.

AGREEMENTS

1 You agree to be responsible for these agreements.

2 You agree to be on time to class and to your laboratory meetings.

3 You agree to complete the assigned reading and homework on time.

4 You agree to complete your laboratory assignments on time.

5 You agree to attend all class and laboratory meetings unless an emergency comes up.

6 You agree to understand the material.

7 You agree to ask questions when you don't understand the material.

8 You agree to communicate any complaints and criticisms you may have only to someone who can do something about the situation and you agree not to complain or to criticize to someone who cannot do something about the situation.

9 You agree to get value out of your participation in the course.

If you attend the next class meeting, you are accepting responsibility for the above agreements.

Syllabus Statements

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 Conduct & Conflict Resolution policies.

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 all public health orders in place to reduce the risk of spreading infectious disease. 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 policy on classroom behavior and the Student Code of Conduct. If you require accommodation because a disability prevents you from fulfilling these safety measures, please follow the steps in the "Accommodation for Disabilities" statement on this syllabus.

As of 13 August 2021, CU Boulder has returned to requiring masks in classrooms and laboratories regardless of vaccination status. This requirement is a temporary precaution during the delta surge to supplement CU Boulder's COVID-19 vaccine requirement. Exemptions include individuals who cannot medically tolerate a face covering, as well as those who are hearing-impaired or otherwise disabled or who are communicating with someone who is hearing-impaired or otherwise disabled and where the ability to see the mouth is essential to communication. If you qualify for a mask-related accommodation, please follow the steps in the "Accommodation for Disabilities" statement on this syllabus. In addition, vaccinated instructional faculty who are engaged in an indoor instructional activity and are separated by at least 6 feet from the nearest person are exempt from wearing masks if they so choose.

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. In this class, if you are sick or quarantined, you will be able to participate via zoom.

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 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 academic integrity policy. Violations of the Honor Code may include, but are not limited to: 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); 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 on the Honor Code 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 or against 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 email cureport@colorado.edu. Information about OIEC, university policies, reporting options, and the campus resources can be found on the OIEC website.

Please know that faculty and graduate 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 their rights, support resources, and reporting options.

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. See the campus policy regarding religious observances for full details.

References

Arnal, Luc H., Flinker, A., Kleinschmidt, A., Giraud, A.-L., & Poeppel, D. (2015, 2015/08/03/). Human Screams Occupy a Privileged Niche in the Communication Soundscape. *Current Biology, 25*(15), 2051-2056. https://doi.org/10.1016/j.cub.2015.06.043

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. *Proceedings of the Royal Society B: Biological Sciences, 285*(1870), 20172430. https://doi.org/10.1098/rspb.2017.2430

Devyatko, D., Appelbaum, L. G., & Mitroff, S. R. (2017, 2017/01/01). A Common Mechanism for Perceptual Reversals in Motion-Induced Blindness, the Troxler Effect, and Perceptual Filling-In. *Perception, 46*(1), 50-77. https://doi.org/10.1177/0301006616672577

Gelstein, S., Yeshurun, Y., Rozenkrantz, L., Shushan, S., Frumin, I., Roth, Y., & Sobel, N. (2011). Human Tears Contain a Chemosignal. *Science, 331*(6014), 226-230. https://doi.org/10.1126/science.1198331

Gračanin, A., van Assen, M. A. L. M., Omrčen, V., Koraj, I., & Vingerhoets, A. J. J. M. (2017, 2017/01/02). Chemosignalling effects of human tears revisited: Does exposure to female tears decrease males' perception of female sexual attractiveness? *Cognition and Emotion, 31*(1), 139-150. https://doi.org/10.1080/02699931.2016.1151402

Guterstam, A., Petkova, V. I., & Ehrsson, H. H. (2011). The Illusion of Owning a Third Arm. *PLoS ONE, 6*(2), e17208. http://dx.doi.org/10.1371%2Fjournal.pone.0017208

Held, R. M. (1965). Plasticity in sensory-motor systems. *Scientific American, 213*(5), 84-94. https://doi.org/doi:10.1038/scientificamerican1165-84

Jacobs, G. H., & Nathans, J. (2009). The evolution of primate color vision. *Scientific American, 300*(April), 53-63. https://www.jstor.org/stable/26001303

Kaufman, E. L., & Rock, I. (1962). The Moon Illusion. *Scientific American, 207*(1), 120-131. https://doi.org/10.1038/scientificamerican0762-120

Keegan, N. L. (2019). Children who say hand dryers 'hurt my ears' are correct: A real-world study examining the loudness of automated hand dryers in public places. *Paediatrics & Child Health*. https://doi.org/10.1093/pch/pxz046

Most, S. B., & Astur, R. S. (2007). Feature-based attentional set as a cause of traffic accidents. *Visual Cognition, 15*(2), 125-132. https://doi.org/10.1080/13506280600959316

Most, S. B., Scholl, B. J., Clifford, E. R., & Simons, D. J. (2005). What You See Is What You Set: Sustained Inattentional Blindness and the Capture of Awareness. *Psychological Review, 112*(1), 217-242. https://doi.org/ https://doi.org/10.1037/0033-295X.112.1.217

Owens, D. A., Antonoff, R. J., & Francis, E. L. (1994). Biological motion and nighttime pedestrian conspicuity. *Human Factors, 36*(4), 718-732. https://doi.org/10.1177/001872089403600411

Plomp, R., & Levelt, W. J. M. (1965). Tonal consonance and critical bandwidth. *Journal of the Acoustical Society of America, 38*(4), 548-560. https://doi.org/https://doi.org/10.1121/1.1909741

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

Slater, M., Spanlang, B., Sanchez-Vives, M. V., & Blanke, O. (2010). First Person Experience of Body Transfer in Virtual Reality. *PLoS ONE, 5*(5), e10564. http://dx.doi.org/10.1371%2Fjournal.pone.0010564

Swets, J. A. (1961). Is there a sensory threshold? *Science, 134*(3473), 168-177. www.jstor.org/stable/1708294

Thompson, P. G. (1980). Margaret Thatcher: A new illusion. *Perception, 9*(4), 483-484. https://doi.org/10.1068/p090483

Toet, A., Eijsman, S., Liu, Y., Donker, S., Kaneko, D., Brouwer, A.-M., & van Erp, J. B. F. (2020, 2020/10/01). The Relation Between Valence and Arousal in Subjective Odor Experience. *Chemosensory Perception, 13*(2), 141-151. https://doi.org/10.1007/s12078-019-09275-7

Wilson, B. M., Harris, C. R., & Wixted, J. T. (2020). Science is not a signal detection problem. *Proceedings of the National Academy of Sciences, 117*(11), 5559. https://doi.org/10.1073/pnas.1914237117

Wood, J. M. (2020, 2020/03/01). Nighttime driving: visual, lighting and visibility challenges. *Ophthalmic and Physiological Optics, 40*(2), 187-201. https://doi.org/10.1111/opo.12659