

PSYC422: Advanced Topics in Attention

Winter session, 2019

Syllabus

Instructor: Daryl Wilson

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Office Hours: by appointment

Class Time: Monday 1:00-2:30pm and Wednesday 11:30-1:00pm

Class Location: Biosciences 2111

What is Attention?

“Everyone knows what attention is. It is the taking possession by the mind, in clear and vivid form, of one out of what seem several simultaneously possible objects or trains of thought. Focalization, concentration, of consciousness are of its essence. It implies withdrawal from some things in order to deal effectively with others” (James, 1890)

Why Study Attention?

Our perceptual systems can process an incredible amount of information. But do we actually want to experience all of the information arriving at our perceptual receptors? Attention functions to select the information that we want to perceive. In fact, many researchers suggest that without attention, we cannot perceive. Attention then, may be the process that underlies our conscious awareness of the world.

Learning Outcomes

- To develop an understanding of the classic and current issues within the field of attention.
- To effectively evaluate and communicate research concepts within the field of attention.
- To research in depth a question regarding one of the issues regarding attentional control.

Course Format

- The first week will provide an introduction to the history of attention research.
- The next eight weeks will focus on a particular attentional topic.
- Monday is Day 1 and Wednesday is Day 2 for each week.
- Readings and weekly reflection papers must be done 24 hours prior to the Day 1 class. The reflection papers will be used to spur discussion during the Day 1 class. Presentations of articles related to each week’s topic will be done during the Day 2 class.
- The last three weeks will consist of poster-style presentations of research proposals.

Workload

Participation

Participation will be evaluated at the end of the term by both your peers and the professor.

Weekly Reflection Papers

For each of eight weeks, you will be required to submit a reflection paper. You have a great deal of flexibility as to what you write about. The goal is to provide evidence that, one you did the readings, and two that you thought about the readings. Do not simply provide a summary of the readings. Rather any ideas, questions, or criticisms you had with the readings would be useful. The maximum length is 1 page double-spaced. These reflection papers will be discussed during the Day 1 class. They are due 24 hours prior to the Day 1 class. That is, they are due the day before at 1pm. Late reflection papers will not be accepted.

Topic Presentation

You will be assigned one week in which you are to identify an article related to that week's topic and provide a 10 minute presentation during the Day 2 class of that week. Your presentation will summarize the rationale for the study, the method, and the key findings. You will also provide a one-page handout that again summarizes the rationale for the study, the method, and the key findings (include any relevant figures). It is due the day of your presentation. The one-page handout should be printed and distributed to each member of the class on the day of your presentation. . Late submissions will be penalized 10% per day.

Research Proposal Report

On the last day of class, you will submit a research paper on a topic of current interest within the field of attention. This paper will include a review of past research relevant to your topic, and a proposal for future research. Late papers will be penalized 10% per day.

Research Proposal Poster Presentation

- The last three weeks will be used to present your research proposals (see Research Proposal Report) in a poster-style environment.
- Each student will provide a 5 minute poster presentation describing their research proposal (followed by a 5 minute question period), and a one-page poster handout.
- Both the students and the instructor will evaluate your poster presentation.

Evaluation

| | |
|---------------------------------------|----------------|
| Class Participation | 15% |
| Reflection Papers | 25% (8 papers) |
| Topic Presentation | 15% |
| Research Proposal Report | 30% |
| Research Proposal Poster Presentation | 15% |

Readings

There is no textbook. Readings will consist of articles—typically, review articles.

Grading Scheme

All components of this course will receive numerical percentage marks. The final grade you receive for the course will be derived by converting your numerical course average to a letter grade according to Queen's Official Grade Conversion Scale:

Queen's Official Grade Conversion Scale

| Grade | Numerical Course Average (Range) |
|--------------|---|
| A+ | 90-100 |
| A | 85-89 |
| A- | 80-84 |
| B+ | 77-79 |
| B | 73-76 |
| B- | 70-72 |
| C+ | 67-69 |
| C | 63-66 |
| C- | 60-62 |
| D+ | 57-59 |
| D | 53-56 |
| D- | 50-52 |
| F | 49 and below |

Academic Integrity

Academic Integrity is constituted by the six core fundamental values of honesty, trust, fairness, respect, responsibility and courage (see www.academicintegrity.org). These values are central to the building, nurturing and sustaining of an academic community in which all members of the community will thrive. Adherence to the values expressed through academic integrity forms a foundation for the "freedom of inquiry and exchange of ideas" essential to the intellectual life of the University (see the Senate Report on Principles and Priorities <http://www.queensu.ca/secretariat/policies/senate/report-principles-and-priorities>).

Students are responsible for familiarizing themselves with the regulations concerning academic integrity and for ensuring that their assignments conform to the principles of academic integrity. Information on academic integrity is available in the Arts and Science Calendar (see Academic Regulation 1 <http://www.queensu.ca/artsci/academic-calendars/regulations/academic-regulations/regulation-1>), on the Arts and Science website (see <http://www.queensu.ca/artsci/academics/undergraduate/academic-integrity>), and from the instructor of this course. Departures from academic integrity include plagiarism, use of unauthorized materials, facilitation, forgery and falsification, and are antithetical to the

development of an academic community at Queen's. Given the seriousness of these matters, actions which contravene the regulation on academic integrity carry sanctions that can range from a warning or the loss of grades on an assignment to the failure of a course to a requirement to withdraw from the university.

Disability Accommodations

Queen's University is committed to achieving full accessibility for people with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. The Senate Policy for Accommodations for Students with Disabilities was approved at Senate in November 2016 (see <https://www.queensu.ca/secretariat/sites/webpublish.queensu.ca.uslcwww/files/files/policies/senateandtrustees/ACADACCOMMPOLICY2016.pdf>). If you are a student with a disability and think you may need academic accommodations, you are strongly encouraged to contact the Queen's Student Accessibility Services (QSAS) and register as early as possible. For more information, including important deadlines, please visit the QSAS website at: <http://www.queensu.ca/studentwellness/accessibility-services/>

Academic Considerations for Students with Extenuating Circumstances

Queen's University is committed to providing academic consideration to students experiencing extenuating circumstances that are beyond their control and are interfering with their ability to complete academic requirements related to a course for a short period of time, not to exceed three months. Students receiving academic consideration must meet all essential requirements of a course. The Senate Policy on Academic Consideration for Students in Extenuating Circumstances was approved at Senate in April, 2017 (see <http://www.queensu.ca/secretariat/sites/webpublish.queensu.ca.uslcwww/files/files/policies/senateandtrustees/Academic%20Considerations%20for%20Extenuating%20Circumstances%20Policy%20Final.pdf>) Each Faculty has developed a protocol to provide a consistent and equitable approach in dealing with requests for academic consideration for students facing extenuating circumstances. Arts and Science undergraduate students can find the Faculty of Arts and Science protocol and the portal where a request can be submitted at: <http://www.queensu.ca/artsci/accommodations>. Students in other Faculties and Schools who are enrolled in this course should refer to the protocol for their home Faculty.

If you need to request academic consideration for this course, you will be required to provide the name and email address of the instructor provided earlier.

Course Schedule

| Date | Topic | Readings |
|---------------|---|--|
| Week 1: Day 1 | Organizational Meeting | None |
| Week 1: Day 2 | History of Attention Research | Pashler (1988) Tsotos et al. (2005) |
| Week 2: Day 1 | Attentional Capacity -- Discussion | Franconeri et al. (2013) Lavie (2005) |
| Week 2: Day 2 | Attentional Capacity -- Presentations | |
| Week 3: Day 1 | Attention in Time – Discussion | Klein (2000) Klein & MacInnes (1999) Shapiro et al. (1997) |
| Week 3: Day 2 | Attention in Time -- Presentations | |
| Week 4: Day 1 | Change/Inattentional Blindness -- Discussion | Simons & Levin (1997) Chun & Marois (2002) Simons (2000) |
| Week 4: Day 2 | Change/Inattentional Blindness -- Presentations | |
| Week 5: Day 1 | Object-Based Attention -- Discussion | Scholl (2001) Moore et al. (1998) Pratt & Sekuler (2001) |
| Week 5: Day 2 | Object-Based Attention -- Presentations | |
| Week 6: Day 1 | Attention and Eye Movements -- Discussion | Awh et al. (2006) Theeuwes et al. (1998) Hooge et al. (2005) |
| Week 6: Day 2 | Attention and Eye Movements -- Presentations | |
| Week 7: Day 1 | Multifocal Attention -- Discussions | Cavanagh & Alvarez (2005) Fehd & Seiffert (2008) |
| Week 7: Day 2 | Multifocal Attention -- Presentations | |
| Week 8: Day 1 | Training of Attention -- Discussions | Green & Bavelier (2003) Green & Bavelier (2006) |
| Week 8: Day 2 | Training of Attention -- Presentations | |
| Week 9: Day 1 | Attention and Memory -- Discussions | Kiyonaga & Egner (2014) Awh & Jonides (2001) Downing (2000) |
| Week 9: Day 2 | Attention and Memory -- Presentations | |

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|----------------|---------------------------------|--|
| Week 10: Day 1 | Research Proposal Presentations | |
| Week 10: Day 2 | Research Proposal Presentations | |
| Week 11: Day 1 | Research Proposal Presentations | |
| Week 11: Day 2 | Research Proposal Presentations | |
| Week 12: Day 1 | Research Proposal Presentations | |
| Week 12: Day 2 | Research Proposal Presentations | |

Readings

Week 1: History of attention research

Pashler, H. E. (1998). *The psychology of attention*. Cambridge, MA: The MIT Press. (just the introduction – pp. 1-32)

Tsotsos, J. K., Itti, L., & Rees, G. (2005). A brief and selective history of attention. In L. Itti, G. Rees, and J. K. Tsotsos (Eds.). *Neurobiology of attention* (pp. xxiii-xxxii). San Diego, CA: Elsevier Academic Press.

Week 2: Attentional capacity

Franconeri, S. L., Alvarez, G. A., & Cavanagh, P. (2013). Flexible cognitive resources: competitive content maps for attention and memory. *Trends in Cognitive Sciences*, 17(3), 134-141.

Lavie, N. (2005). Distracted and confused?: Selective attention under load. *Trends in Cognitive Sciences*, 9, 75-82.

Week 3: Attention in Time

Klein, R. M. (2000). Inhibition of return. *Trends in Cognitive Sciences*, 4, 138-147.

Klein, R.M. & MacInnes, W.J. (1999). Inhibition of return is a foraging facilitator in visual search. *Psychological Science*, 10, 346-352.

Shapiro, K. L., Arnell, K. M., & Raymond, J. E. (1997). The attentional blink. *Trends in Cognitive Sciences*, 1, 291-296.

Week 4: Change / Inattentional Blindness

Simons, D. J., & Levin, D. T. (1997). Change blindness. *Trends in Cognitive Sciences*, 1, 261-267.

Chun, M. M., & Marois, R. (2002). The dark side of visual attention. *Current Opinion in Neurobiology*, 12, 184-189.

Simons, D. J. (2000). Attentional capture and inattentional blindness. *Trends in Cognitive Sciences*, 4, 147-155.

Week 5: Object-Based Attention

Scholl, B.J. (2001). Objects and attention: the state of the art. *Cognition*, 80, 1-46.

Moore, C.M., Yantis, S. & Vaughan, B. (1998). Object-based visual selection: Evidence from perceptual completion. *Psychological Science*, 9, 104-110.

Pratt, J., & Sekuler, A.B. (2001). The effects of occlusion and past experience on the allocation of object-based attention. *Psychonomic Bulletin & Review*, 8, 721-727.

Week 6: Attention and Eye Movements

Awh, E., Armstrong, K. M., & Moore, T. (2006). Visual and oculomotor selection: links, causes, and implications for spatial attention. *Trends in Cognitive Sciences*, 10, 124-130.

Theeuwes, J., Kramer, A.F., Hahn, S., & Irwin, D.E. (1998). Our eyes do not always go where we want them to go: Capture of the eyes by new objects. *Psychological Science*, 9, 379-385.

Hooge, I.T.C., Over, E.A.B., van Wezel, R.J.A., & Frens, M.A. (2005). Inhibition of return is not a foraging facilitator in saccadic search and free viewing, *Vision Research*, 45, 1901-1908.

Week 7: Multifocal Attention

Cavanagh, P., & Alvarez, G. A. (2005). Tracking multiple targets with multifocal attention. *Trends in Cognitive Sciences*, 9, 349-354.

Fehd, H. M., & Seiffert, A. E. (2008). Eye movements during multiple object tracking: Where do participants look? *Cognition*, 108, 201-209.

Week 8: Training of Attention

Green, C. S., & Bavelier, D. (2003). Action video game modifies visual attention. *Nature*, 423, 534-537.

Green, C.S., & Bavelier, D. (2006). Effect of action video games on the spatial distribution of visuospatial attention. *Journal of Experimental Psychology: Human Perception and Performance*, 23, 1465-1478.

Week 9: Attention and Memory

Kiyonaga, A., & Egner, T. (2014). The Working Memory Stroop Effect When Internal Representations Clash With External Stimuli. *Psychological Science*, 25(8), 1619-1629.

Awh, E., & Jonides, J. (2001). Overlapping mechanisms of attention and spatial working memory. *Trends in Cognitive Sciences*, 5, 119-126.

Downing, P.E. (2000). Interactions between visual working memory and selective attention. *Psychological Science*, 11, 467-473.

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