LING 910: Visual-World Eye Tracking in Spoken Word Recognition
(#59961)

Spring 2017

Instructor:	Annie Tremblay	**Schedule:**	M/W 3:00-4:15 pm
Office:	BL 415	**Room:**	BL 418 (Class), DHDC 4068 (Lab)
Email:	atrembla@ku.edu	**Office Hours:**	M/W 1:00-2:00 pm or by appt.

Course Description and Objectives

This course focuses on visual-world eye-tracking research in spoken word recognition. It will provide you with the foundation needed to carry out visual-world eye-tracking research in spoken word recognition. Throughout the semester, you will read visual-world eye-tracking studies that investigate how various factors (i.e., phonological and orthographic similarity, lexical frequency, neighborhood density, fine-grained phonetic details, sentence-level prosody, lexical stress, lexical tones, and conceptual similarity) influence spoken word recognition. You will learn about the time course of these types of information in spoken word recognition, and in so doing you will become familiar with current theories of spoken word recognition. You will also read studies that discuss methodological issues to consider in visual-world eye-tracking research. Using the empirical, theoretical, and methodological knowledge gained from the assigned readings, you will work on a class project to be decided together with the rest of the class. With your classmates, you will work on all aspects of the research project, from experimental design to data collection and data analysis. You will then create a poster that summarizes the class project and present it at the end of the semester. The course will consist of class discussions, oral presentations, online forums, article reviews, and the class project.

Prerequisites: Students should have taken at least one course in psycholinguistics AND at least one course in phonetics. Students who do not meet these prerequisites will need the instructor's approval to take the course.

Required Materials

There is no textbook for this course. Instead, the following articles will be read. The articles with an asterisk (*) are available for student presentations.

Allopenna, P. D., Magnuson, J. S., & Tanenhaus, M. K. (1998). Tracking the time course of spoken word recognition using eye movements: Evidence for continuous mapping models. *Journal of Memory and Language, 38*, 419-439.

Altmann, G. T. (2011). Language can mediate eye movement control within 100 milliseconds, regardless of whether there is anything to move the eyes to. *Acta Psychologica, 137*, 190-200.

Barr, D. J., Gann, T. M., & Pierce, R. S. (2011). Anticipatory baseline effects and information integration in visual world studies. *Acta Psychologica, 137*, 201-207.

*Dahan, D., & Gaskell, G. M. (2007). The temporal dynamics of ambiguity resolution: Evidence from spoken-word recognition. *Journal of Memory and Language, 57*, 483-501.

*Dahan, D., Magnuson, J. S., & Tanenhaus, M. K. (2001). Time course of frequency effects in spoken-word recognition: evidence from eye movements. *Cognitive Psychology, 42*, 317-367.

*Dahan, D., Magnuson, J. S., Tanenhaus, M. K., & Hogan, E. M. (2001). Subcategorical mismatches and the time course of lexical access: Evidence for lexical competition. *Language and Cognitive Processes, 16*, 507-534.

*Dahan, D., & Tanenhaus, M. (2005). Looking at the rope when looking for the snake: Conceptually mediated eye movements during spoken-word recognition. *Psychonomics Bulletin & Review, 12*, 453-459.

*Huettig, F., & Altmann, G. T. (2011). Looking at anything that is green when hearing "frog": how object surface colour and stored object colour knowledge influence language-mediated overt attention. *Quarterly Journal of Experimental Psychology, 64*, 122-145.

*Huettig, F., & McQueen, J. M. (2007). The tug of war between phonological, semantic and shape information in language-mediated visual search. *Journal of Memory and Language, 57*, 460-482.

Huettig, F., Rommers, J., & Meyer, A. S. (2011). Using the visual world paradigm to study language processing: A review and critical evaluation. *Acta Psychologica, 137*, 151-171.

*Magnuson, J. S., Dixon, J. A., Tanenhaus, M. K., & Aslin, R. N. (2007). The dynamics of lexical competition during spoken word recognition. *Cognitive Science, 31*, 133-156.

*McMurray, B., Clayards, M. A., Tanenhaus, M. K., & Aslin, R. N. (2008). Tracking the time course of phonetic cue integration during spoken word recognition. *Psychonomics Bulletin Review, 15*, 1064-1071.

*McMurray, B., Tanenhaus, M. K., & Aslin, R. N. (2009). Within-category VOT affects recovery from "lexical" garden paths: Evidence against phoneme-level inhibition. *Journal of Memory and Language, 60*, 65-91.

*McQueen, J. M., & Viebahn, M. C. (2007). Tracking recognition of spoken words by tracking looks to printed words. *Quarterly Journal of Experimental Psychology, 60*, 661-671.

Mirman, D., Dixon, J. A., & Magnuson, J. S. (2008). Statistical and computational models of the visual world paradigm: Growth curves and individual differences. *Journal of Memory and Language, 59*, 475-494.

*Reinisch, E., Jesse, A., & McQueen, J. M. (2010). Early use of phonetic information in spoken word recognition: Lexical stress drives eye movements immediately. *Quarterly Journal of Experimental Psychology, 63*, 772-783.

Salverda, A. P., Brown, M., & Tanenhaus, M. K. (2011). A goal-based perspective on eye movements in visual world studies. *Acta Psycholica, 137*, 172-180.

*Salverda, A. P., Dahan, D., Tanenhaus, M. K., Crosswhite, K., Masharov, M., & McDonough, J. (2007). Effects of prosodically modulated sub-phonetic variation on lexical competition. *Cognition, 105*, 466-476.

*Shatzman, K. B., & McQueen, J. M. (2006). Segment duration as a cue to word boundaries in spoken-word recognition. *Perception & Psychophysics, 68*, 1-16.

*Shen, J., Deutsch, D., & Rayner, K. (2013). On-line perception of Mandarin Tones 2 and 3: evidence from eye movements. *Journal of the Acoustical Society of America, 133*, 3016-3029.

Tanenhaus, M. K., Spivey-Knowlton, M. J., Eberhard, K. M., & Sedivy, J. C. (1995).
    Integration of visual and linguistic information in spoken language comprehension. *Science,
    268*, 1632-1634.

Course website: http://courseware.ku.edu

Course Requirements

Participation (10%)

Participation includes arriving in class on time, contributing to the online forums, and contributing
to discussions in class.

1. Class attendance is crucial, as many of the issues that we will cover, including some of the
    hands-on lab work, will be discussed only in class. Please arrive in class on time. Late arrivals
    disrupt the class.

2. You are expected to participate in the online forums on the course website. Whenever you see
    "Discussion Board" in the calendar, you must submit at least ONE question or comment about
    the reading(s) for that day (EVEN IF you present that reading). You are also encouraged to
    reply to your classmates' questions or comments. Your questions/comments are due by 12
    AM the day of class.

3. All students are expected to contribute voluntarily to the class (e.g., speak up, ask questions,
    volunteer to demonstrate exercises, etc.). You should always come prepared for class. This
    entails reading the material to be covered in class before coming to class.

Presentations (20%)

You will present TWO articles on the assigned reading list to the rest of the class (10% each).
You should have read the articles carefully and present them to the rest of the class using some
form of visual aid (e.g., PPT). The presentation should evaluate the (theoretical and empirical)
strengths and weaknesses of the study. It is intended to take the form of an open discussion rather
than a formal presentation. Hence, students' questions/comments in the online discussion forums
should be incorporated in your presentation.

Critical Reviews (20%)

You will be asked to write a critical review (approx. 8 pages) of TWO articles to be discussed in
this class (10% each). The first review is of the **Allopenna, Magnuson, and Tanenhaus (1998)**
study, and the second review is of the **Dahan, Magnuson, Tanenhaus, and Hogan (2001)** study.
Detailed guidelines will be provided.

Late assignment policy: The reviews are to be turned in via Blackboard **on their due date by the
beginning of class** (i.e., **by 3:00 pm**; see the calendar for the due dates). Because these reviews are
time-sensitive (the articles are discussed the day the review is due), late reviews will NOT be

accepted. Otherwise, it is unfair for other students, because the students who submit their review after class will have received more information about the paper.

Research Project (50%)

You will work on a class research project. All students registered in the seminar will work on the project together. The focus of the project will be decided as a class during the semester. The research project will take place in the Second Language Processing and Eye Tracking Lab.

Research Proposal (10%)

You will be asked to write a brief proposal that outlines a study you would like to conduct (see the calendar for the due date). You should choose one study that you found particularly interesting during the first 7 weeks classes and think of a follow-up study that would be important to conduct in order to address a question left unanswered by the existing study. Once you have determined what your follow-up study would be, you should do a search for recent studies in the literature to ensure that no one has yet conducted the study you have in mind. If your proposed study has already been conducted, you should think of another study (or perhaps a follow-up to the more recent study that you found). If it has not yet been conducted, you can go ahead and begin writing your research proposal. The first three pages of your proposal should lay out the theoretical issues that your proposed study would investigate and cite relevant research investigating these issues (including more recent studies, if applicable). The last three pages should layout the experimental design that your study would have and how it would be carried out (e.g., with images, with orthographic words, etc.). Your proposed study should of course be a visual-world eye-tracking study, and for feasibility reasons it should involve speakers that are easy to find in Lawrence. When describing your experimental design, you should give the conditions that your experiment would have and provide concrete examples. You should end your proposal with a statement about what your proposed study would contribute to the literature on its topic. Each student should submit his/her own proposal.

Everyone's proposals will then be summarized by the instructor and discussed with everyone during a class period. Following this discussion, as a class, the most promising (and realistic) proposal will be selected and conducted for the class project.

Materials (5%)

Everyone will contribute to the creation of the materials needed for the experiment. This will be done in a few stages: (i) the creation of the test items, (ii) the recording of the stimuli, (iii) the selection of images (if the experiment uses images), and (iv) the splicing and analysis of the stimuli. Class time will be spent in the lab to do these tasks, but students will also need to work on (i)-(iv) outside class time. The timeline is rather tight, hence responsibilities must be shared among all members of the group. Because it is difficult to track who does what, you will receive a group grade for the creation of the materials.

Experiment (5%)

Everyone will contribute to the creation of the eye-tracking experiment. A script from Experiment Builder will be provided to you in advance to facilitate this task, and class time will be spent in the lab to create the experiment. Two class periods are dedicated to the creation of the eye-tracking experiments, but you may need to spend some time outside class time to finish up the experiment. Because it is difficult to track who does what, you will receive a group grade for the creation of the experiment.

Data Collection (5%)

Each student is expect to collect data from two speakers (after the pilot testing phase). You should keep track of the participant number from whom you collected data and report it to the instructor when requested.

Data Analysis (5%)

You will analyze the eye-tracking data following one of the methods you learned in class (i.e., linear mixed-effects models and/or growth curve analysis in R). Everyone will be taught how to do so, but some students may be more experienced than others in running the analyses. Hence, team work is important for the data analysis—also to make sure that there are no errors. Because team work is particularly encouraged for this part, you will receive a group grade for the data analysis.

Poster (20%)

You will present the class project in a poster. Although this is a group project, each student will create his/her own poster. Examples of posters will be provided. The creation of the poster is worth 15%. Then, in the time slot selected for the final exam, you will present your poster to the rest of the class. This will not be a traditional poster presentation, because otherwise everyone would be presenting the same study, and the last presenter would be at an advantage over the first presenter. Instead, you will explain to the rest of the class why you created your poster the way you did (what motivated your choice of layout, color, font size, text, etc.). The presentations will be followed by a discussion of what parts of what poster students liked and why. This exercise is done to encourage you to think about what makes your poster easy to follow and efficient. It will also be interesting to see individual differences among students in how they presented the same research. The presentation of the poster is worth 5%.

Academic Misconduct

Academic misconduct will not be tolerated. Strict procedures for reporting plagiarism in written assignments will be enforced. If plagiarism discovered, you will receive a zero for that portion of your final grade and the incident will be reported to University authorities. If such academic misconduct occurs a second time you will receive an F in the course and the incident will again be reported to University authorities. Note that a second incidence of plagiarism on record at the university may in some cases result in a transcript citation.

Grading

		B+	89.99–86.67	C+	79.99–76.67	D+	69.99–66.67
A	100–93.33	B	86.66–83.33	C	76.66–73.33	D	66.66–63.33
A–	93.32–90	B–	83.32–80	C–	73.32–70	D–	63.32–60

F   <60

Resources Available for University of Kansas Students

The Academic Achievement & Access Center (AAAC) coordinates accommodations and services for all KU students who are eligible. If you have a disability for which you wish to request accommodations and have not contacted the AAAC, please do so as soon as possible. Their office is located in 22 Strong Hall; their phone number is 785-864-4064 (V/TTY).

Information about their services can be found at http://disability.ku.edu. Please contact me privately in regard to your needs in this course.

Other resources: KU Writing Center: http://www.writing.ku.edu
KU Career Center: http://www.kucareerhawk.com
KU Counseling and Psychological Services: http://www.caps.ku.edu/

Calendar (subject to change)

Date	Topic	Reading (to be read before class)	Assignments DUE
Week 1			
Jan. 18 (W) (Class)	Introduction to the Course and Overview of the Literature	Tanenhaus, Spivey-Knowlton, Eberhard, & Sedivy (1995) Huettig, Rommers, & Meyers (2011), Sections 1-2, 4, 6	
Week 2			
Jan. 23 (M) (Class)	Dynamics of Lexical Competition	Allopena, Magnuson, & Tanenhaus (1998)	**Article Review 1**
Jan. 25 (W) (Class)		Dahan, Magnuson, & Tanenhaus (2001)	Discussion Board 1
Week 3			
Jan. 30 (M) (Class)	Dynamics of Lexical Competition	Dahan & Gaskell (2007)	Discussion Board 2
Feb. 1 (W) (Class)		Magnuson, Dixon, Tanenhaus, & Aslin (2007)	Discussion Board 3
Week 4			
Feb. 6 (M) (Class)	Fine-grained Phonetic Information	Dahan, Magnuson, Tanenhaus, & Hogan (2001)	**Article Review 2**
Feb. 8 (W) (Class)		McMurray, Clayards, Tanenhaus, & Aslin (2008)	Discussion Board 4

Week 5			
Feb. 13 (M) (Class)	Fine-grained Phonetic Information	McMurray, Tanenhaus, & Aslin (2009)	Discussion Board 5
Feb. 15 (W) (Class)	Word Boundaries	Shatzman & McQueen (2006)	Discussion Board 6
Week 6			
Feb. 20 (M) (Class)	Prosody	Salverda, Dahan, Tanenhaus, Crosswhite, Masharov, & McDonough (2007)	Discussion Board 7
Feb. 22 (W) (Class)	Stress	Reinisch, Jesse, & McQueen (2010)	Discussion Board 8
Week 7			
Feb. 27 (M) (Class)	Lexical Tones	Shen, Deutsch, & Rayner (2013)	Discussion Board 9
Mar. 1 (W) (Class)	Conceptual Activation	Dahan & Tanenhaus (2005), Huettig & Altmann (2011)	**Research Proposals Due**
Week 8			
Mar. 6 (M) (Class)	Orthography	McQueen & Viebahn (2008)	Discussion Board 10
Mar. 8 (W) (Class)	Class Project: Discussion of research proposals and selection of class project, responsibilities assigned	n/a	
Week 9			
Mar. 13 (M) (Class)	Time course of phonological/orthographic, semantic, and shape information	Huettig & McQueen (2007)	**All Test Items Created**
Mar. 15 (W) (Lab)	Class Project: Correction of materials following instructor's feedback	n/a	
Week 10			
Spring Break			
Week 11			
Mar. 27 (M) (Class)	Goal-based perspective and the linking hypothesis	Salverda, Brown, & Tanenhaus (2011)	**Stimuli Recorded, Images Selected (if Using Images)**
Mar. 29 (W) (Lab)	Class Project: Replacement of recordings or images following instructor's feedback, overview of visual-world eye-tracking script in Experiment Builder	n/a	

Week 12			
Apr. 3 (M) (Lab)	<u>Class Project</u>: Creating a visual-world eye-tracking experiment in Experiment Builder	n/a	**Stimuli Spliced, Analyzed, and Ready for the Experiment**
Apr. 5 (W) (Lab)			
Week 13			
Apr. 10 (M) (Lab)	<u>Class Project</u>: Running a visual-world eye-tracking experiment with Eye Link II	n/a (experiment is pilot tested on team members)	**Experiment Ready to be Administered**
Apr. 12 (W) (Class)	Launching a Saccade	Altmann (2011)	
Week 14			
Apr. 17 (M) (Class)	Baseline Corrections	Barr, Gann, & Pierce (2011)	
Apr. 19 (W) (Class)	Statistical Analyses: Issues to Consider	n/a (handout to be given)	
Week 15			
Apr. 24 (M) (Class)	Growth Curve Analysis	Mirman, Dixon, & Magnuson (2008)	
Apr. 26 (W) (Lab)	<u>Class Project</u>: Analyzing eye-movement data from a visual-world eye tracking-experiment with Data Viewer and Python	n/a	**Data Collection Completed**
Week 16			
May 1 (M) (Lab)	<u>Class Project</u>: Analyzing eye-movement data from a visual-world eye tracking-experiment with Data Viewer and Python	n/a	
May 3 (W) (Class)	Wrap-up and Course Evaluations	n/a	**Data Analysis Completed**

Final Poster Presentations on Thursday, May 11th, from 1:30 to 3:00 pm