

CGSC130 The Musical Mind: An Introduction to Cognitive Science
Fall 2020, Justin London, Instructor

Class Meeting Times

M, W: 11:30 am-12:40 pm CDT ONLINE

(F: 11:20 pm -12:20 pm CDT as needed)

F2F group meeting times are ad hoc; Zoom passwords will be e-mailed to enrolled students

Online office hours: Thurs via appointment

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Required Texts and Materials:

The Cambridge Handbook of Cognitive Science, K. Frankish and W. M. Ramsey, eds.

ISBN-13: 978-0-521-69190-1. Available online (less than \$5.00 to rent a Kindle edition).

Additional readings and course materials (PDFs and PPTs) and audio recordings (mp3s) are on the course Moodle Page.

Course Description and Goals

Cognitive Science is a messy discipline. Indeed, it isn't really a discipline at all, but a place where any number of disciplines intersect: Psychology, Sociology, Biology, Neuroscience, Computer Science, and Linguistics, to name the usual suspects. Like Psychology, Cognitive Science's aim is to understand the human mind, but it extends Psychology's remit by looking at a broader range of the things humans and human minds can do. Which brings us to music. Through a musical lens, we will look at the following topics which are central to Cognitive Science:

- Perception--How we perceive musical sounds (and what makes them special)
- Memory--What is typical and what is special about musical memory
- Meaning and Language--The extent to which music is a language, and how music is meaningful
- Emotion--How music can give rise to emotional responses
- Gifted and Broken Brains—What perfect pitch, and its opposite tone deafness can tell us about the mind
- Embodied Cognition--How music cognition depends on both our brains and our bodies
- Evolutionary Cognition—How humans developed their unique cognitive capacities, including music

We will read and (virtually) discuss a broad range of texts, from classic works on memory and language to the most recent work in music neuroscience. There will be musical illustrations and demonstrations of some of the phenomena we will be studying, and we replicate a few experiments, giving you a first-hand sense of how these questions are studied.

Course Syllabus and Moodle

The course syllabus gives a chronology for the topics we will discuss at each class meeting, along with readings and assignments. Each unit is listed separately on the Moodle page, but we will roughly cover one topic per week. While lectures are online, most class activities will be synchronous. Most weeks we will “meet” twice (usually Monday and Wednesday) during our scheduled course time for lecture and Socratic discussion. On some days student groups will present some of the material. The other class meeting time each week will be used for F2F meetings with student groups (more details below); in addition to our scheduled class time, student groups will meet at other mutually convenient times (e.g., common time on Thurs; Convo time on Friday).

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For each unit, there are several core readings (with prompts and reading guides), a pre-class activity (e.g., seeing if you can identify familiar songs from a single note; testing if you have absolute pitch, etc.), and additional handouts, podcasts (prepared by yours truly), audio files, and other relevant materials. Items on the syllabus are listed on the days they will be discussed, so you will want to read/listen/watch them beforehand.

Student Group Work

Some small group work will be a key aspect of the course, both as means of dealing with our COVID-induced constraints, but more importantly as a means of leveraging students' interests and backgrounds. Based upon your musical and academic backgrounds, I will divide the class into six groups (4-5 students per group). This group will work together throughout the term, focusing on a particular course topic. So, for example, a group of students with a background in linguistics will be studying aspects of meaning in music; another group with a background in psychology will look a musical memory, and so forth. Each group will do the following:

- Over the course of the term, help present material in a particular unit relevant to their given topic as part of the regular course lectures.
- Investigate a particular focus topic (for example, for the group tasked with studying auditory and musical memory, their topic will be “earworms”), focusing on the work of a particular researcher.
- Virtually meet with that researcher for questions and discussion; a group of distinguished researchers has enthusiastically agreed to meet with members of our class—as we are all helping each other out during these strange times for college teaching and learning.
- Prepare a presentation on their focus topic and present it to the class; presentations will be given during the last three meeting days of the term.

Course Assessment

Your course grade will be based upon the following components:

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| • Group Assistance with Lecture: | 15% |
| • Group Project | 25% |
| • Midterm | 20% |
| • Final | 30% |
| • Class Participation | 10% |

The group project includes meetings with JML, a virtual meeting with your chosen researcher, preparation of a handout on the topic, and final in-class presentation. Class participation includes the preparatory assignments as well as ad-hoc short presentations (e.g., I will ask a student to explain a particular term, give some background on a researcher, etc.—these will be requested ahead of class). The midterm and final are both take-home exams; they will be distributed and collected via the course Moodle page.

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Course Readings

- Bartlett, F. C. (1932). *Remembering: A Study in Experimental and Social Psychology*. Cambridge University Press: 61-94.
- Bregman, A. S. (1990). *Auditory Scene Analysis: The Perceptual Organization of Sound*. Cambridge, Mass, MIT Press: 1-45.
- Clarke, E. F. "Categorical Rhythmic Perception: An Ecological Perspective." in *Action and Perception in Rhythm and Music*, ed. Alf Gabrielsson. Stockholm: Royal Swedish Academy of Music **55** (1987): 19-33.
- Call, J. & Tomasello, M. (2008). Does the chimpanzee have a theory of mind? 30 years later. *Trends in Cognitive Sciences* 12.5: 187-192.
- Damasio, A. (1999). *The Feeling of What Happens: Body and emotion in the making of consciousness*. Harcourt Brace & Co.: 35-81.
- Deutsch, D. (2013). Absolute Pitch. From *The Psychology of Music*, 3d Edition; D. Deutsch, Ed. Academic Press: 141-182.
- Eerola, T., & Vuoskoski, J. K. (2017). A comparison of the discrete and dimensional models of emotion in music. *Psychology of Music* 39.1: 18-49.
- Ekman, P. (1999). Basic emotions. In the *Handbook of Cognition and Emotion*, T. Dalgleish & M. Power, eds. John Wiley & Sons, pp. 138-154.
- Gaver, W. W. (1993). How do we hear the world?: Explorations in ecological acoustics. *Ecological Psychology* 5.5: 285-313.
- Gibson, J. J. (1966). *The Senses Considered as Perceptual Systems*. Houghton Mifflin Co. Chapters 1-3.
- Goldstone, R. L., & Hendrickson, A. T. (2010). Categorical perception. *WIREs Cognitive Science* 1.1: 69-78.
- Halpern, A. R., & Bartlett, J. C. (2011). The persistence of musical memories: A descriptive study of earworms. *Music Perception* 28(4): 425-432.
- Huron, D. (2006). *Sweet Anticipation: Music and the Psychology of Expectation*. MIT Press: 1-40.
- Jakubowski, K., Finkel, S., Stewart, L., & Müllensiefen, D. (2016). Dissecting an earworm: Melodic features and song popularity predict involuntary musical imagery. *Psychology of Aesthetics, Creativity, and the Arts*. 11.2: online.
- Jakubowski, K., Farrugia, N., Halpern, A. R., Sankarpani, S. K., & Stewart, L. (2015). The speed of our mental soundtracks: Tracking the tempo of involuntary musical imagery in everyday life. *Memory and Cognition* 43:1229-1242.
- Juslin, P., & Sloboda, J. "Music and Emotion." In *The Psychology of Music*, 3d Edition, Diana Deutsch, Ed. New York: Academic Press (2013): 583-645
- Levitin, D. J. (1994). Absolute memory for musical pitch: Evidence from the production of learned melodies. *Perception & Psychophysics* 56(4): 414-423.

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- Levitin, D. J., & Rogers, S. E. (2005). Absolute pitch: Perception, coding, and controversies. *TRENDS in Cognitive Sciences* 9(1): 26-33.
- London, J., Burger, B., Thompson, M., & Toiviainen, P. (2016). Speed on the dance floor: Auditory and visual cues for musical tempo. *Acta Psychologica* 164: 70-80.
- London, J. "Meter as a Kind of Attentional Behavior" and "Relevant Research on Rhythm Perception and Production." Chapters 1 and 2 of *Hearing In Time: Psychological Aspects of Musical Meter*, 2nd Edition". Oxford: Oxford University Press (2012): 9-47
- McDermott, J. H. (2010). The cocktail party problem. *Current Biology* 19.22 R1024-1027.
- Merchant, H., & Honing, H. (2014). Are non-human primates capable of rhythmic entrainment? Evidence for the gradual audiomotor evolution hypothesis. *Frontiers in Neuroscience* 7, article 274. doi: 10.3389/fnins.2013.00274
- Patel, A. D., Iversen, J. R., Bregman, M. R., & Schultz, I. (2009). Experimental evidence for synchronization to a musical beat in a non-human animal. *Current Biology* 19: 827-830. Supplemental information at: [http://www.cell.com/current-biology/supplemental/S0960-9822\(09\)00890-2](http://www.cell.com/current-biology/supplemental/S0960-9822(09)00890-2).
- Peretz, I., & Coltheart, M. (2003). Modularity of music processing. *Nature Neuroscience* 6.7: 688-691.
- Peretz, I., Champod, A. S., & Hyde, K. (2003). Varieties of musical disorders: The Montreal Battery of Evaluation of Amusia. *Annals of the NY Academy of Sciences* 999: 58-75.
- Phillips-Silver, J., et al. (2011). Born to dance but beat deaf: A new form of congenital amusia. *Neuropsychologia* 49(5): 961-969.
- Pitt, D. (2020). Mental Representation. *The Stanford Encyclopedia of Philosophy*, Edward N. Zalta, ed. plato.stanford.edu/archives/spr2020/entries/mental-representation
- Rasch, R. and R. Plomp (1999). The Perception of Musical Tones. *The Psychology of Music, 2nd Edition*. D. Deutsch, Ed. Academic Press: 89-110.
- Robbins, P. (2017). Modularity of Mind. In *The Stanford Encyclopedia of Philosophy*, E. N. Zalta, ed. plato.stanford.edu/archives/win2017/entries/modularity-mind
- Roth, M. (2010). Representation. *WIREs Cognitive Science* 1.1: 32-39.
- Sloboda, J., & Juslin, P. N. (2001). Psychological Perspectives on Musical Emotion. In *Music and Emotion: Theory and research*, P. N. Juslin & J. Sloboda, Eds. Oxford University Press: 71-104.
- Spence, C. (2011). Cross-modal perceptual organization. In *The Oxford Handbook of Perceptual Organization*, J. Wagemans, ed. DOI: 10.1093/oxfordhb/9780199686858.013.015