

Music and the Mind

Location: Peterson 104
Time: 10:00 – 10:50 MWF, Spring 2018

Professor: [Sarah Creel](#) (screel at ucsd)
Office hours: Wed 11-12, CSB 167; or email me!

Teaching Assistant: Zoe Cheng (tzcheng at ucsd)
Office hours: Fri 9-10 in SSRB 235, or by appointment

Course textbook:

Thompson, W. F. (2013). *Music, thought, and feeling: Understanding the psychology of music* (2nd ed.). New York: Oxford.

More readings and schedule:

Available [here](#)

Suggested readings:

Ani Patel (2008). *Music, the Brain, and Language*.
Leonard Meyer (1956). *Emotion and Meaning in Music*.
David Huron (2006). *Sweet Anticipation*.

Course overview

How does music affect thought and perception? People have asked how language affects thought and perception, but music has been strongly linked to the perception of motion, emotions, a sense of stability vs. instability, and bodily movement. Experience with music in childhood can affect how the brain processes sound, and may be related to differences in language perception. In this class, we will discuss developmental, behavioral, neural, and genetic influences on the processing of musical pitch and rhythm. Some class meetings will be lectures, but most will be discussions based on the readings.

Course goals

- Gain knowledge about music cognition
- Become familiar with locating primary sources
- Learn to critique scientific papers
- Improve your writing skills

How to succeed in the class

- Read the assigned articles/chapters.
- Participate in class discussions.
- Complete all short writing assignments.
- Study for in-class quizzes.
- Complete the final paper assignment.
- Follow guidelines for academic honesty throughout (below).

Assignments

Short papers

- Five times during the quarter, you will summarize one article briefly (2 pages) out of the set of readings for that week, following the writing guidelines specified on the course website.
- Turn it in on TritonEd at the beginning of class on Monday.
- You should demonstrate that you're thinking about what you're reading and that you're utilizing concepts discussed in class.
- You can do one extra and I'll drop your lowest short-paper grade.

Final paper (more info on the course website)

- Design your own experiment!
- Paper should consist of a literature review that leads up to the research question you want to ask, followed by a detailed plan of how you would conduct the experiment.
- Alternatively, you can write a review paper on a topic of interest. A review paper is your own synthesis of a comprehensive set of articles on a particular topic.
- Consult with me by *end of Week 5* about content.
- Some content guidelines [here](#), though some variations in form are allowable. Obviously, you won't have a "Results" section because you haven't done the experiment.

General paper formatting guidelines

- Please use 1-inch margins and 12-point font, double-spaced. Times font is preferred. Try to use as little direct quotation as possible; summaries and the final paper should be in your own words. If you are quoting more than 1-2 sentences directly (remember to give citations in the text and "include page number(s);" Creel, 2013, p. 12), it's too much. The reference list and in-text citations should follow APA style. The paper listed below is an example of reference list format. (DOI numbers can be omitted.)
- Creel, S. C. (2013). A cognitive science investigation of citation style in American college courses. *Journal of Made-Up Results*, 4(12), 1-120.

Midterm

- In Week 3, to make sure everyone is up to speed on terminology
- I'll provide a study guide

(continued)

Policies

Grading:

- Five short papers, each of which summarizes a published paper from class: 30% (6% each). If you complete 6, your lowest grade will be dropped.
- Midterm: 20%
- Course attendance and participation: 20%
- Final paper: 30% (10% for annotated bibliography; 20% for final paper itself)

Grades will be assigned as follows:

- A 93-100
- A- 90-92
- B+ 86-89
- B 83-85
- B- 80-82
- C+ 76-79
- C 73-75
- C- 70-72
- D 60-70
- F 0-59

Academic honesty:

- Cheating is a disservice to yourself and others. Don't do it. See [here](#) for more information, or ask me if you're in doubt. (It's okay to ask!)
- You can paraphrase things from the article[s] you read, but cite them (Creel, 2009, *Journal of Null Results*). Try to avoid direct quotations by putting things in your own words. If you do quote directly, it should be "in quotes as well as cited" (Creel, 2009, p. 42).
- You can discuss the articles with others, but you cannot share material that you write.
- Your writing should be your own, not another student's.
- It should not contain more than 20 words of quotation (cited or otherwise) from the article(s) you are writing about.

Classroom behavior:

Please refrain from using electronic devices for any non-class purpose. It is disrespectful and **distracting to other students** to tweet, check Facebook, etc. in the middle of a course ([Sana, Weston, & Cepeda, 2013, *Computers and Education*](#)). If this becomes a persistent problem, expect to be called on to share the contents of your computer screen!

Late work:

Generally not accepted. If you have an exceptional situation, please consult me in advance.

Absences:

Please let me know in advance. Because this is a discussion-based course, any absence should be made up by reading the assigned articles and writing a 3-page summary of one of them. **If you miss a lecture, it is your responsibility consult one of your fellow students to get notes from another member of the class.**

Schedule of assignments and readings
(article links available on course website only)

Summaries must be done on the required articles--not the chapters. If you'd like permission to use one of the "further reading" articles for your summary, talk to me in advance to make sure it will work (some are review papers and thus don't fit the mold for summarizing a study).

Week 1 (4/2): Auditory grouping

Introductory lecture: what is music and how do we study it?

Lecture and tutorial: auditory grouping; finding scientific articles and writing good papers

No writing assignment this week

Required reading

- Thompson, Chapters 1 and 3
- Bregman, A. S., & Campbell, J. (1971). Primary auditory stream segregation and perception of order in rapid sequences of tones. *Journal of Experimental Psychology*, 89(2), 244–249.

Week 2 (4/9): Tonality, rhythm, and timbre

Lecture: Musical patterns

Discussion: What is a musical “key”?

Required reading

- Thompson, Chapter 4
- Krumhansl, C. L., Bharucha, J. J., & Kessler, E. J. (1982). Perceived harmonic structure of chords in three related musical keys. *Journal of Experimental Psychology: Human Perception and Performance*, 8(1), 24–36.
- McDermott, J. H., Schultz, A. F., Undurraga, E. A., & Godoy, R. A. (2016). Indifference to dissonance in native Amazonians reveals cultural variation in music perception. *Nature*, 25, 21–25. <http://doi.org/10.1038/nature18635>

Further reading

- Brown, H., Butler, D., & Jones, M. R. (1994). Musical and Temporal Influences on Key Discovery. *Music Perception*, 11(4), 371–407.
- Iverson, P., & Krumhansl, C. L. (1993). Isolating the dynamic attributes of musical timbre. *Journal of the Acoustical Society of America*, 94(5), 2595–603.
- Povel, D.-J., & Essens, P. J. (1985). Perception of temporal patterns. *Music Perception*, 2(4), 411–440.
- Temperley, D., & Marvin, E. W. (2008). Pitch-class distribution and the identification of key. *Music Perception*, 25(3), 193–212.

Week 3 (4/16): Specificity in musical memory

Midterm on Wednesday 4/18

Lecture: specificity in music

Discussion: How specific is musical memory?

Required reading

- Schellenberg, E. G., & Trehub, S. E. (2003). Good pitch memory is widespread. *Psychological Science, 14*(3), 262–6.
- Schellenberg, E. G., Iverson, P., & McKinnon, M. C. (1999). Name that tune: identifying popular recordings from brief excerpts. *Psychonomic Bulletin & Review, 6*(4), 641–6.

Further reading

- Creel, S. C. (2011). Specific previous experience affects perception of harmony and meter. *Journal of Experimental Psychology: Human Perception and Performance, 37*(5), 1512–1526.
- Palmer, C., Jungers, M. K., & Jusczyk, P. W. (2001). Episodic memory for musical prosody. *Journal of Memory and Language, 45*(4), 526–545. doi:10.1006/jmla.2000.2780

Week 4 (4/23): Pitch perception: ontogeny and phylogeny

Lecture: Pitch processing in animals and humans

Discussion: Do other animals hear pitch the same way as humans?

Required reading

- Thompson, Chapter 5
- Snowdon, C. T., & Teie, D. (2010). Affective responses in tamarins elicited by species-specific music. *Biology Letters, 6*(1), 30–2. doi:10.1098/rsbl.2009.0593
- Bregman, M. R., Patel, A. D., & Gentner, T. Q. (2012). Stimulus-dependent flexibility in non-human auditory pitch processing. *Cognition, 122*(1), 51–60. doi:10.1016/j.cognition.2011.08.008
- Trehub, S. E., Bull, D., & Thorpe, L. A. (1984). Infants' perception of melodies: The role of melodic contour. *Child Development, 55*(3), 821–830.

Further reading

- MacDougall-Shackleton, S. A., & Hulse, S. H. (1996). Concurrent absolute and relative pitch processing by European starlings (*Sturnus vulgaris*). *Journal of Comparative Psychology, 110*(2), 139–146. doi:10.1037/0735-7036.110.2.139
- Miyazaki, K., & Ogawa, Y. (2006). Learning absolute pitch by children: a cross-sectional study. *Music Perception, 24*(1), 63–78.
- Saffran, J. R., & Griepentrog, G. J. (2001). Absolute pitch in infant auditory learning: evidence for developmental reorganization. *Developmental Psychology, 37*(1), 74–85.
- Wright, A. A., Rivera, J. J., Hulse, S. H., Shyan, M., & Neiwirth, J. J. (2000). Music perception and octave generalization in rhesus monkeys. *Journal of Experimental Psychology: General, 129*(3), 291–307. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11006902>

Week 5 (4/30): Pitch, genes, and the brain

Lecture: Influences on absolute pitch perception

Debate topic: Is absolute pitch perception innate?

Required reading

- Thompson, Chapter 6
- For summary purposes, Gregersen and Henthorn papers *must be summarized together*.
- Gregersen, P. K., Kowalsky, E., Kohn, N., & Marvin, E. W. (2001). Early Childhood Music Education and Predisposition to Absolute Pitch: Teasing Apart Genes and Environment. *American journal of Medical Genetics*, 282(2000), 280–282.
- Henthorn, T., & Deutsch, D. (2007). Ethnicity Versus Early Environment: Comment on “Early Childhood Music Education and Predisposition to Absolute Pitch: Teasing Apart Genes and Environment.” *American Journal of Medical Genetics*, 143A, 102–103.
- Hamilton, R. H., Pascual-leone, A., & Schlaug, G. (2004). Absolute pitch in blind musicians. *Neuroreport*, 15(5), 9–12.
- Pfordresher, P. Q., & Brown, S. (2009). Enhanced production and perception of musical pitch in tone language speakers. *Attention, Perception, & Psychophysics*, 71(6), 1385–1398. doi:10.3758/APP

Further reading

- Zatorre, R. J. (2003). Absolute pitch: a model for understanding the influence of genes and development on neural and cognitive function. *Nature neuroscience*, 6(7), 692–5.
- Schellenberg, E. G., & Trehub, S. E. (2008). Is there an Asian advantage for pitch memory? *Music Perception*, 25(3), 241–252.

Week 6 (5/7): Meter: ontogeny and phylogeny

Lecture: Meter processing in animals and humans

Discussion: Who’s got rhythm?

Required reading

- Hannon, E. E., & Trehub, S. E. (2005a). Metrical categories in infancy and adulthood. *Psychological Science*, 16(1), 48–55.
- Phillips-Silver, J., & Trainor, L. J. (2005). Feeling the beat: movement influences infant rhythm perception. *Science*, 308(5727), 1430. doi:10.1126/science.1110922
- Patel, A. D., Iversen, J. R., Bregman, M. R., & Schulz, I. (2009). Experimental evidence for synchronization to a musical beat in a nonhuman animal. *Current Biology*, 19(10), 827–30. doi:10.1016/j.cub.2009.03.038

Further reading

- Hannon, E. E., & Trehub, S. E. (2005b). Tuning in to musical rhythms: Infants learn more readily than adults. *Proceedings of the National Academy of Sciences*, 102(35), 12639–12643.
- McAuley, J. D., Jones, M. R., Holub, S., Johnston, H. M., & Miller, N. S. (2006). The time of our lives: life span development of timing and event tracking. *Journal of Experimental Psychology: General*, 135(3), 348–67. doi:10.1037/0096-3445.135.3.348

Week 7 (5/14): Rhythm and the brain

Annotated bibliographies due (Ted) by 11:59pm Sunday night after Week 7

Lecture: Brain methods to examine rhythm processing

Discussion: What is meter?

Required reading

- Brochard, R., Abecasis, D., Potter, D., Ragot, R., & Drake, C. (2003). The “ticktock” of our internal clock: direct brain evidence of subjective accents in isochronous sequences. *Psychological Science*, *14*(4), 362–6. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/12807411>
- Iversen, J. R., Repp, B. H., & Patel, A. D. (2009). Top-Down Control of Rhythm Perception Modulates Early Auditory Responses. *Annals of the New York Academy of Sciences*, *1169*, 58–73. doi:10.1111/j.1749-6632.2009.04579.x

Further reading

- Snyder, J. S., & Large, E. W. (2005). Gamma-band activity reflects the metric structure of rhythmic tone sequences. *Cognitive Brain Research*, *24*(1), 117–26. doi:10.1016/j.cogbrainres.2004.12.014

Week 8 (5/21): Music's relationship to other cognitive skills

Lecture: Music, language, and other cognitive abilities

Debate topic: Is music a language?

Required reading

- Thompson, Chapter 11
- Dick, F. K., Lee, H. L., Nusbaum, H. C., & Price, C. J. (2011). Auditory-motor expertise alters “speech selectivity” in professional musicians and actors. *Cerebral Cortex*, *21*(4), 938–48. doi:10.1093/cercor/bhq166
- Slevc, L. R., & Miyake, A. (2006). Individual differences in second-language proficiency: does musical ability matter? *Psychological Science*, *17*(8), 675–81. doi:10.1111/j.1467-9280.2006.01765.x

Further reading

- Iversen, J. R., Patel, A. D., & Ohgushi, K. (2008). Perception of rhythmic grouping depends on auditory experience. *Journal of the Acoustical Society of America*, *124*(4), 2263–71. doi:10.1121/1.2973189
- Patel, A. D., & Daniele, J. R. (2003). An empirical comparison of rhythm in language and music. *Cognition*, *87*, B35–B45. doi:10.1016/S0
- Kempe, V., Bublitz, D., & Brooks, P. J. (2013). Musicality and non-native speech sound processing are linked through temporal, pitch and spectral acuity. In *Proceedings of the 32nd annual Conference of the Cognitive Science Society* (pp. 752–757).

Week 9 (5/28): Music and metaphor (Or your choice! We'll vote in class.)

Lecture: Different kinds of musical metaphors

Discussion: Is music mainly metaphoric or symbolic?

Required reading

- Rusconi, E., Kwan, B., Giordano, B. L., Umiltà, C., & Butterworth, B. (2006). Spatial representation of pitch height: the SMARC effect. *Cognition*, *99*(2), 113–29. doi:10.1016/j.cognition.2005.01.004
- Eitan, Z., & Timmers, R. (2010). Beethoven's last piano sonata and those who follow crocodiles: cross-domain mappings of auditory pitch in a musical context. *Cognition*, *114*(3), 405–22. doi:10.1016/j.cognition.2009.10.013 **Just pages 405-410**

Further reading

- Martino, G., & Marks, L. E. (2001). Synesthesia: Strong and Weak. *Current Directions in Psychological Science*, *10*(2), 61–65. doi:10.1111/1467-8721.00116

Week 10 (6/4): Music and emotion

Lecture: Effects of music on emotion

Debate topic: Why do people like music?

(Friday: papers due--extensions through exam week possible)

Required reading

- Thompson, Chapter 7
- Fritz, T., Jentschke, S., Gosselin, N., Sammler, D., Peretz, I., Turner, R., ... Koelsch, S. (2009). Universal Recognition of Three Basic Emotions in Music. *Current Biology*, *19*(7), 1–4. doi:10.1016/j.cub.2009.02.058
- Sauter, D. A., Eisner, F., Ekman, P., & Scott, S. K. (2010). Cross-cultural recognition of basic emotions through nonverbal emotional vocalizations. *Proceedings of the National Academy of Sciences*, *107*(6), 2408–12. doi:10.1073/pnas.0908239106

Further reading

- Dalla Bella, S., Peretz, I., Rousseau, L., & Gosselin, N. (2001). A developmental study of the affective value of tempo and mode in music. *Cognition*, *80*(3), B1–10. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/11274986>