

Music 007

Music, Language, Mind, Evolution

Class meets: MW, 5 – 6:45 p.m, Media Theater (M110), Theater Arts Center

Instructor, Larry Polansky
Email: lpolansk@ucsc.edu
<http://eamusic.dartmouth.edu/~larry/classes>

TAs: Ben Negley (bnegley@ucsc.edu), David Kant (dkant@ucsc.edu), Ryan Lambe (rlambe@ucsc.edu)
Instructor office hours: Wednesday, 1 – 3 (Music Building, 292)

Introduction

This course will examine the “deep roots” of music, in terms of human and other species’ perception, evolution, the connection to language, and our own cognition of sound and music. We will structure the course around 8 invited guest speakers from outside of UCSC, and one from within: three artists/composers (Christian Wolff, Douglas Repetto, David Dunn); two music cognition researchers (David Huron, Thalia Wheatley), two experts on language (Carol Padden, Aniruddh Patel, the latter also a music cognition scholar), and two animal communication researchers (Katy Payne, Rex Cocroft, the latter also works on plant vibrational communication).

Nine of the 20 or so classes will consist of a talk, open to the public, by one of the guests. The rest will be lectures by the instructor, which will often include discussion of one of the guests, as well as presenting new material on related subjects.

Readings

Required Text: *Music, Language and the Brain*, Aniruddh Patel (weekly readings from that book)
Other weekly shorter assignments (associated with individual guests)

Assignments

Students are asked to write *responses* to 7 out of the 9 guests (your choice), and one *final, longer response* to a chapter (of your choice) in the Patel book. All assignments should be submitted to eCommons (to appropriate folders: Week 1, Week 2, ...) as inline text (no attachments).

7 Responses

Students are asked to write a *short response* (250 – 400 words) to 7 out of 9 of the invited guests, to be submitted to the corresponding folder for that guest on eCommons no later than class time on the Monday following that guest’s lecture. Due dates are noted in the schedule below. Late responses won’t be accepted.

As discussed in class, students may write an extra response (for a total of 8), and the lowest grade will be dropped.

The responses should give but not focus on a short recap of what the guest talked about, and then discuss in depth some aspect of the lecture, offering the student’s own considered, researched, and intelligent opinions. Refrain from using up space describing how much you liked (or didn’t like) the guest, how cool (or uncool) the guest was, how you felt that day, why you were late, etc. These should be articulate, to-the-point writings that would be interesting to others as a way of learning what was said, and how you were able to connect it to the readings, the class lectures, and other material. They should also

make it very clear that you were present and paid close attention. See the class eCommons sight for a detailed list of suggestions and a grading rubric.

Final Assignment

The final assignment should be 500 – 750 words, similar to the individual responses, but now pertaining to one chapter in the Patel text, or if more appropriate, a significant section of a chapter about a particular topic of interest. You may read extra material (perhaps following up some of the citations in the book), or simply give serious thought to the material in the text. As in the responses, please articulate, briefly, the content of what you are discussing, and then discuss it intelligently, and with insight. Again, pretend you are presenting this material to an intelligent reader who has not read the material, and wants to know both what is contained, and what you, who has taken a class pertaining to the material, think about it. *The final assignment is due by 5:00 p.m, June 5.*

Grading

Responses and final assignment will be graded in the normal fashion, reflecting writing quality, the originality and coherence of thought and argument, and evidence of having paid attention to the lecture and/or read the text carefully. The in-class discussions about the grading as well as the posted rubric should be a clear guide. Each response will be 10% of the grade, the final assignment 30%. No late papers accepted.

Class Schedule

Week 1

March 30, April 2: *Introduction to the class.*

- Meetings, assignments TAS, grading, readings
 - An overview of the guests
- Introduction to the professor
- What is music? What might music universals be? What are some definitions of music? What separates music from other sounds?
- Aron's prolegomenon to "biomusicology"
 - suggested criteria (at least two needed): intentionality, formalism, time (and temporal ratios), pulse, collectivism, periodicity, symmetry, scale, interaction, repertoires
- What might the evolutionary purpose of music be? What are factors in its evolution?
- Is music a language? If not, what's the difference? What are the similarities between music and language?
 - Musical examples, asking some fundamental questions
- Fundamentals of acoustics and psychoacoustics. Sound, frequency/pitch, amplitude/intensity/loudness, "timbre"

Readings

Patel: Chapter 1 (Introduction) and Chapter 2 ("Sound Elements: Pitch and Timbre")

Simha Aron: "Prolegomena to a Biomusicology," from *The Origins of Music*, MIT Press, 2001 (on eCommons and online in UCSC library)

Week 2:

April 6: *Carol Padden, "Origins of Sign Languages"*

Deaf studies scholar and sign language researcher, 2010 MacArthur Fellow and Dean of Social Sciences at UC San Diego

April 8: More on sign language, and examples of artistic “musical” expression in sign. Questions from the class on sign and ASL. Examples of ASL storytelling, evolution, and fundamental artistic principles.

- Some examples of poetic uses of sign:
 - Debbie Rennie: “The Swan,” “Veal Boycott”
 - Patrick Graybill. “Reflection,” “Liberation”
 - Rosa Lee: “All I Want”
 - Ella Lentz: “Eye Music”
 - Polansky/Graybill: *Paradox*

Readings

Patel: Chapter 3 (“Rhythm”)

Lane, Hoffmeister, Bahan: “Form and Function in ASL,” in *A Journey into the Deaf-World*, Dawn Sign Press, 1996 (on eCommons)

Watchings:

Ella Lentz: “Eye Music,” ASL poem <http://www.americandeafculture.com/eye-music-by-ella-mae-lentz.html> Debbie Rennie: “Swan,” ASL poem, <http://dst710.weebly.com/debbie-rennie---swan.html>

Polansky: “Paradox,” short ASL opera, <https://www.youtube.com/watch?v=JdSfTv3PlaY>

Week 3:

April 13, *Christian Wolff*,

American composer, Emeritus Strauss Professor of Music, Dartmouth College

[Assignment 1 (Padden) due Monday by class time]

April 15, Discussion of Wolff, musical notation, and more on acoustics; more on the music of Christian Wolff

- Heterophony as a musical and evolutionary/universal idea:
 - heterophony in other species
 - the “Star Spangled Banner” (in-class exercise, with baseball caps!)
 - “contagious heterophony” (wolves; hyenas)

Continuing on with the fundamentals of sound and perception (exponential perception).

Readings

Rzewski, “The Algebra of Everyday Life,” and Wolff: “Composer’s Notes” for *10 Exercises* CD, New World Records, available on DRAM online in UCSC library

<http://www.dramonline.org/albums/christian-wolff-ten-exercises/notes>

Various: “Sounds American 10: Conversations with Drury...Pinkas...Pisaro...Polansky,” <http://soundamerican.org/stephen-druryinterrogation-of-soundmicro> (read conversation with Drury, and others if you like)

Listening

Wolff: *10 Exercises*, #1, #10 (both versions), #18

<http://www.dramonline.org/albums/christian-wolff-ten-exercises>

Week 4:

April 20, Acoustics and psychoacoustics; acoustic/cognitive correlates of sonic description; ratiometric perception. A discussion (and rubric) of grading: suggestions for better responses. Detailed discussion of the nPVI language/music function, as discussed in Patel.

- Computer programs written in PD and Java to demonstrate “reconstruction” of a specific nPVI value

[Assignment 2 (Wolff) due Monday by class time]

April 22, Acoustics and psychoacoustics

Readings No readings this week

Week 5:

April 27, *Katy Payne*, “Sound in the Lives of Whales and Elephants”

Acoustic biologist, founder of the Elephant Listening Project, and whale song expert

April 29, *Thalia Wheatley*, “Why Music Moves Us”

Cognitive scientist, leading researcher in the nascent field of perception of emotion

Readings

Patel: Chapter 6 (“Meaning”)

Payne, K.: “The progressively changing songs of humpback whales: A window on the creative process in a non-human mammal.” *Origins of Music*, MIT Press, 2000. (on eCommons, and online in UCSC library)

Sievers, Polansky, Casey, Wheatley: “Music and movement share a dynamic structure that supports universal expressions of emotion,” *Proceedings of the National Academy of Sciences*, 2012 (on eCommons)

Week 6:

May 4, *David Huron*, “Investigating Music's Origins: Making Use of the Pleasure Principle”

Pioneering and pre-eminent scholar in music cognition and cognitive musicology

Talk Abstract:

Is music an evolutionary adaptation? This lecture doesn't answer that question. Instead we consider some of the tools available for addressing the issue. One of the foremost tools is "following the money" of pleasure: Adaptive behaviors are encouraged through a combination pleasure and pain. By examining the specific pleasures evoked by music, we can better infer what adaptive functions (if any) might be served through music-making.

May 6, Discussion of Payne/Wheatley

- Demonstration and explanation of harmonics
- Pitch chroma/pitch height
- Implementation of universal dynamics in music (as per Wheatley): *Anna's Music Box* software.

[Assignment 3 and/or 4 (Payne, Wheatley) due Monday by class time].

Readings

Patel: Chapter 4 (“Melody”)

Huron: “Is Music an Evolutionary Adaptation?,” Isabelle Peretz & Robert Zatorre (editors), *The Cognitive Neuroscience of Music*. Oxford University Press, 2003 (on eCommons)

“The Melodic Arch in Western Folksongs,” *Computing in Musicology*, 1996 (on eCommons)

Week 7:

May 11, *Rex Cocroft*, “Insects, Plants, and Music”

Groundbreaking researcher in insect and plant intelligence and vibrational communication

[Assignment 5 (Huron) due Monday by class time]

May 13,

- Discussion of Cocroft
 - Discussion of the acoustics and mechanisms of non-human communication. What are more general meanings of the word “sound,” such as those for the word “music” (especially in the context of insect communication and more generally, vibrational communication?).
 - Similarly what is “pitch”? Do insects hear pitch if their frequency “organization” of frequency is unknowable, or so far from ours that “pitch” becomes an anthropocentric term? Do insects, plants, hear and/or respond to relative frequencies in any way, or absolute configurations? What is, in a larger biotic sense, “pitch” perception?
- Discussion of Patel (“Melody”)
 - What is meant by contour?
 - A contour test?
- Music’s connection to language
 - Compositions and software illustrating ideas and techniques in Patel’s chapter on melodic importance of speech and music, and the confluences of melody and speech
 - The use of Praat (formants, pulses, F0)
 - Pieces by Carter Scholz based on Chris Mann text/performance passage (*Mannagram*, extraction of consonants/vowels; “An Economy of Virtual Knowns,” F0 tracking,)
 - Time and the voice (nPVI-related as opposed to the above, MIV-related)
 - Pieces by Polansky based on Chris Mann text/performance (“Time Studies,” “Four Voice Canon #12,” “Chris Choir”)
 - A simpler, non-technological example: “Four Voice Canon #14” (“Kid Canon”)

Readings

Cocroft and Rodríguez: “The Behavioral Ecology of Insect Vibrational Communication,” *BioScience*, 2005 (on eCommons)

Cocroft, Gogala, Hill and Wessel, “Fostering Research Progress in a Rapidly Growing Field,” chapter in *Studying Vibrational Communication, Edition: Animal Signals and Communication*, Springer, 2014 (on eCommons)

Week 8:

May 18, Douglas Repetto, “forever wild”

Composer, sound- and bio-artist, founder of the international DorkBot movement

[Assignment 6 (Cocroft) due Monday by class time]

May 20, Music, evolution, artistic responses to biological and ecological issues. More pieces that connect music and language:

- Alvin Lucier: *I am sitting in a room*
- Steve Reich: *Come Out*

Readings

Patel: Chapter 7 (“Evolution”)

Olga Fehér, Haibin Wang, Sigal Saar, Partha P. Mitra & Ofer Tchernichovski: “De novo establishment of wild-type song culture in the zebra finch,” *Nature*, 2009 (on eCommons)

Wendell Berry, “Farmland Without Farmers,” *The Atlantic*, March, 2015 (linked on eCommons) (<http://m.theatlantic.com/national/archive/2015/03/farmland-without-farmers/388282/>)

Week 9:

May 27 (Wednesday, No Class on Monday May 25, Memorial day), *Aniruddh Patel*, “Hidden connections between the evolution of music and language”

Cognitive scientist, author of the major and innovative work Music, Language, and the Brain

[Assignment 7 (Cocroft) due Monday by class time]

Readings

Patel: Chapter 5 (“Syntax”)

Patel: “Music, biological evolution, and the brain,” in *Emerging Disciplines*, M. Bailar (ed.).
Rice University Press, 2010 (on eCommons)

Week 10:

June 1, *David Dunn*, composer, environmental sound artist and researcher, UCSC Music and DANM faculty

[Assignment 8 (Patel) due Monday by class time;

Assignment 9 (Dunn) due Friday, June 8, by 5 p.m.]

June 3, Special TA “open office hours,” in class, to help with final assignments, and anything else.

Readings

Dunn:

“Listening to the Soundscape and the Necessity of Double Description” (published in *Moebius Journal* Issue 1, 2012, iARTA) (on eCommons)

“The Limits to Listening” (Keynote Address delivered to “The Conversation: Reciprocal Relations in Sonic Ecology Conference,” Vancouver, Canada, 2014 (on eCommons)

June 5, midnight

Final Assignment due (longer paper, not one of the 7 responses).