

Psychology 66 - Music Cognition

Amherst College: Spring, 2010

Thursday: 2:00 – 4:30; Merrill 314

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Music hath charms to soothe a savage breast,

To soften rocks, or bend a knotted oak.

~ William Congreve, dramatist (1670-1729)

Course Overview

Over the last 20 years the psychological study of music has matured from a sporadic enterprise into a continuous and connected discipline. Despite the rapid growth of interest in music psychology, few psychology departments offer a course that integrates the field. This course will do just this. In the first part of the course, we will explore how psychologists have attempted to understand the basic elements of music. We will discuss the psychological organization of pitch and rhythm, in isolation, and then in combination. We will also examine how musical knowledge is acquired through development.

Thus, the early part of the course we will attempt to understand musical behavior by breaking it down into its constituent components. One drawback to this approach is that music loses much of its richness when analyzed piecemeal. Therefore, the remainder of the course will attempt to analyze behavior surrounding intact musical pieces. We will begin by examining one of the most powerful effects of music: its ability to move us emotionally. This discussion will be followed by an attempt to isolate the factors that lead people to prefer one piece or genre of music to another.

In the last part of the course, we will explore music cognition outside of the laboratory. We will look at how other media (television, movies, and commercials) employ music. We will also look at music as a mnemonic device including how it contributes to our memory for song lyrics. We will discuss how music therapists use music in the treatment of a variety of mental and physical disorders and will end the semester by looking at music from a cross-cultural perspective. Every known human culture engages in some kind of music-making activity. We will try to examine which aspects of musical behavior are universal, and how Eastern and Western musical systems differ.

Readings

You will be responsible for a handful of reading assignments each week. In addition to reading every assigned reading every week, each student periodically will be responsible for presenting one article to the class. Presenting an article will involve not only summarizing the key questions, hypotheses, methodology, results, and interpretation. You will also be expected to foster discussion amongst your peers. Everyone, whether presenting or not, should read the articles critically. By this, I mean you should not necessarily accept the authors' claims at face value. Are their hypotheses warranted? Do they do a good job of setting up an experiment to test their hypotheses? Are their interpretations of the data justified? Can some other theory also explain the results? How might you improve the experiment? What is the next experiment that should be done to further test the theory in question? All weekly readings are available electronically via the CMS web page (click on the Assignments button).

Thought Papers

In addition to the weekly readings, you will also be responsible for turning in a written response to the week's readings. You should use this paper as an opportunity to demonstrate your critical reading of the assignments (see above). **Do not summarize the papers!** Tell me what you think! What were the strong and weak points of the paper? What aspects of the argument/design need clarification? How might you counter the arguments/conclusions made by the author(s)? Do the data support the claims made by the researchers? Why or why not? What might you have done differently? What would be the next important question/experiment to pursue? **Thought papers should vary between a paragraph and a page in length: NO MORE!** If you have more to say, you can hold it for class, just give us the flavor of your thoughts.

Notice that I used the word 'us' in the last paragraph. Everybody in the class will be responsible for reading all of the thought papers for the week. How will you get access to everyone's thought papers? Via the CMS website. I will set up a forum each week in the Discussion Board section of the website (the Discussion Board is located under the Communications button). Your thought papers will be due by **9:00 PM on Wednesdays**. Late papers will receive a grade of 5 out of 10; failure to turn in an assignment will result in a 0.

Class Participation

A seminar is only as good as its participants and the contributions made by those participants. At the end of the semester, your peers and I will grade the quality of your contributions to class. Your peers will use whatever criteria they deem meaningful. I will grade your performance based on the frequency, creativity, and scientific relevance of your input.

Short (4-5 page) paper

I would like you to choose a song that you LOVE and analyze why you like it. Ideally, you will draw on some of the work we will discuss in class, but I would also like you to consult other sources, as well as propose your own hypotheses. **The first draft of this assignment is due Monday, March 1st. The second and final draft of this assignment is due on Friday March 30th.**

Final Project

For your final project, I would like you to research a topic related to music and psychology. You will need to prepare a 15-page paper and a 20-minute presentation on your topic. If you decide to write/speak about one of the areas we discussed in class, be sure you discuss ideas, information and/or sources in addition to the one's covered in class. You can and probably should mention things we discussed in class, but do bring in other sources, too. Your final project is due on **Friday, May 14th**.

Course Grade

Your course grade will be determined, as follows:

Thought Papers	30%
Class Participation	30%
Short Paper	20%
Final Project	20%

Course Schedule

January 28th

Welcome

February 4th

Pitch

- Krumhansl, C.L. (1979). The psychological representation of musical pitch in a tonal context. Cognitive Psychology, 11, 346-374.
- Dowling, W.J. (1978). Scale and contour: Two components of a theory of memory for melodies. Psychological Review, 85, 341-354.
- Levitin, D.J. (1994). Absolute memory for musical pitch: Evidence from the production of learned melodies. Perception & Psychophysics, 56, 414-423.
- Smith, J. D., Kemler Nelson, D.G., Appleton, T. (1994). What child is this? What interval was that? Familiar tunes and music perception in novice listeners. Cognition, 52, 23-54.
- Foxton, J.M., Dean, J.L., Gee, R., Peretz, I., & Griffiths, T.D. (2004). Characterization of deficits in pitch perception underlying 'tone deafness'. Brain, 127, 801-810.

February 11th

Rhythm

- Handel, S. (1989). Listening: An introduction to the perception of auditory events. Cambridge, MA: MIT Press. Selections from Chapter 11.
- Essens, P.J. (1986). Hierarchical organization of temporal patterns. Perception & Psychophysics, 40, 69-73.
- Deutsch, D. (1983). The generation of two isochronous sequences in parallel. Perception & Psychophysics, 34, 331-337.
- Grahn, J.A. & Brett, M. (2007). Rhythm and beat perception in motor areas of the brain. Journal of Cognitive Neuroscience, 19, 893-906.
- Hannon, E.E. & Trehub, S.E. (2005). Metrical categories in infancy and adulthood. Psychological Science, 16, 48-55.
- Dowling, W.J. (1973). Rhythmic groups and subjective chunks in memory for melodies. Perception & Psychophysics, 14, 37-40.

February 18th

Melody

- Jones, M.R., Summerell L. & Marshburn, E. (1987). Recognizing melodies: A dynamic interpretation. Quarterly Journal of Experimental Psychology, 39(A), 89-121.
- Thompson, W.F., Cuddy, L.L., & Plaus, C. (1997). Expectancies generated by melodic intervals: Evaluation of principles of melodic implication in a melody-completion task. Perception & Psychophysics, 59, 1069-1076.
- Hebert, S. & Peretz, I. (1997). Recognition of music in long-term memory: Are melodic and temporal patterns equal partners? Memory & Cognition, 25, 518-533.
- Schulkind, M.D. (1999). Long-term memory for temporal structure: Evidence from the identification of well-known and novel songs. Memory & Cognition, 27, 896-906.
- Lebrun-Guillaud, G., Tillman, B., & Justus, T. (2008). Perception of tonal and temporal structures in chord sequences by patients with cerebellar damage. Music Perception, 271-283.
- Schulkind, M.D., Shulman, R.J., & Rubin, D.C. (2001). Musical features that facilitate melody identification: How do you know it's "your" song when they finally play it? Music Perception, 21, 217-249.

February 25th**Development**

- Krumhansl, C. & Keil, F.C. (1982). Acquisition of the hierarchy of tonal functions in music. Memory & Cognition, *10*, 243-251.
- Trainor, L.J. & Trehub, S.E. (1992). A comparison of infants' and adults' sensitivity to Western musical structure. Journal of Experimental Psychology: Human Perception & Performance, *18*, 394-402.
- Doherty, C.P., Fitzsimons, M., Asenbauer, B., & Staunton, H. (1999). Discrimination of prosody and music by normal children. European Journal of Neurology, *6*, 221-226.
- Soley, G. & Hannon, E.E. (2010). Infants prefer the musical meter of their own culture: A cross-cultural comparison. Developmental Psychology, *46*, 286-292.
- Lynch, M.P., Eilers, R.E., Oller, D.K., & Urbano, R.C. (1990). Innateness, experience, and music perception. Psychological Science, *1*, 272-276.
- Miyazaki, K. & Ogawa, Y. (2006). Learning absolute pitch by children: A cross-sectional study. Music Perception, *24*, 63-78.

March 4th**Emotion**

- Hevner, K. (1936). Experimental studies of the elements of expression in music. American Journal of Psychology, *48*, 248-268.
- Sloboda, J. (1991). Musical structures and emotional response: Some empirical findings. Psychology of Music, *19*, 110-120.
- Blood, A.J. & Zatorre, R.J. (2001). Intensely pleasurable responses to music correlate with activity in brain regions implicated in reward and emotion. Proceedings of the National Academy of Sciences, *98*, 11818-11823.
- Ilie, G. & Thompson, W.F. (2006). A comparison of acoustic cues in music and speech for three dimensions of affect. Music Perception, *23*, 319-329.
- Khalfa, S., Roy, M., Rainville, P., DallaBella, S., & Peretz, I. (2008). Role of tempo entrainment in psychophysiological differentiation of happy and sad music. International Journal of Psychophysiology, *68*, 17-26.
- Thompson, W.F., Russo, F.A., & Quinto, L. (2008). Audio-visual integration of emotional cues in song. Cognition and Emotion, *22*, 1457-1470.

March 11th**Cross-Cultural Studies of Music**

- Balkwill, L.L., Thompson, W.F., & Matsunaga, R. (2004). Recognition of emotion in Japanese, Western, and Hindustani music by Japanese listeners. Japanese Psychological Research, *46*, 337-349.
- Unyk, A.M, Trehub, S.E., Trainor, L.J., & Schellenberg, E.G. (1992). Lullabies and simplicity: A cross-cultural perspective. Psychology of Music, *20*, 15-28.
- Butler, J.W. & Daston, P.G. (1968). Musical consonance as musical preference: A cross-cultural study. Journal of General Psychology, *79*, 129-142.
- Demorest, S.M., Morrison, S.J., Beken, M.N., & Junbluth, D. (2009). Lost in translation: An enculturation effect in music memory performance. Music Perception, *25*, 213-223.
- Baraldi, F.B. (2009). All the pain and joy of the world in a single melody: A Transylvanian case study on musical emotion. Music Perception, *26*, 257-261.

March 25th

Preference

- Christensen, P.G. & Peterson, J.B. (1988). Genre and gender in the structure of music preferences. Communication Research, 15, 282-301
- Stratton, V.N. & Zalanowski, A.H. (1997). The relationship between characteristic moods and most commonly listened to types of music. Journal of Music Therapy, 34, 129-140.
- Rentfrow, P.J. & Gosling, S.D. (2006). Message in a ballad: The role of music preferences in interpersonal perception. Psychological Science, 17, 236 – 242.
- North, A.C. & Hargreaves, D.J. (1995). Subjective complexity, familiarity, and liking for popular music. Psychomusicology, 14, 77-93.
- Holbrook, M.B., & Schindler, R.M. (1989). Some exploratory findings on the development of musical tastes. Journal of Consumer Research, 16, 119-124.

April 1st

Music as a Mnemonic Device

- Chabris, C.F., Steele, K.M., Dalla Bella, S., Peretz, I., Dunlop, T., Dawe, L.A., Humphrey, G.K., Shannon, R.A., Kirby, Jr., J.L., Olmstead, C.G., & Rauscher, F.H. (1998). Prelude or requiem for the Mozart Effect. Nature, 400, 826-828.
- Schellenberg, E.G. (2004). Music lessons enhance IQ. Psychological Science, 15, 511-514.
- Bialystock, E. & DePape, A-M. (2009). Musical expertise, bilingualism, and executive functioning. Journal of Experimental Psychology: Human Perception and Performance, 35, 565-574.
- Wallace, W.T. (1994). Memory for music: Effect of melody on recall of text. Journal of Experimental Psychology: Learning, Memory, & Cognition, 20, 1471-1485.
- Racette, A. & Peretz, I. (2007). Learning lyrics: To sing or not to sing? Memory & Cognition, 35, 242-253.
- Schulkind, M.D., Hennis, L.K., & Rubin, D.C. (1999). Music, emotion, and autobiographical memory: They're playing your song. Memory & Cognition, 27, 948-955.

April 8th

Neuroscience / The Brain

- Levitin, D.J. & Menon, V. (2005). The neural locus of temporal structure and expectancies in music: Evidence from functional neuroimaging at 3 Tesla. Music Perception, 22, 563-575.
- Wilson, S.J. & Saling, M.M. (2008). Contribution of the right and left mesial temporal lobes to music memory: Evidence from melodic learning difficulties. Music Perception, 25, 303-314.
- Plenger, P.M., Breier, J.I., Wheless, J.W., Ridley, T.D., Papnicolaou, A.C., Brookshire, B., et al. (1996). Lateralization of memory for music: Evidence from the intracarotid sodium amobarbital procedure. Neuropsychologia, 34, 1015-18.
- Pantev, C., Oostenveld, R., Engelien, B.R., Roberts, L.E., & Hoke, M. (1998). Increased auditory cortical representation in musicians. Nature (April), 392, 811-814.
- Peretz, I., Brattico, E., Javenpaa, M, and Tervaniemi, M. (2009). The amusic brain: in tune, out of key, and unaware. Brain, 132, 1277-1286.
- Pfordresher, P.Q., and Brown, S. (2007). Poor pitch signing in the absence of “tone deafness”. Music Perception, 25, 95-115.

April 15th

Therapy

- Prickett, C.A. & Moore, R.S. (1991). The use of music to aid memory of Alzheimer's patients. Journal of Music Therapy, 28, 101-110.

- Lipe, A.W. (1991). Using music therapy to enhance the quality of life in a client with Alzheimer's dementia: A case study. Music Therapy Perspectives, *9*, 102-105.
- Brotons, M. & Pickett-Cooper, P.K. (1996). The effects of music therapy intervention on agitation behaviors of Alzheimer's disease patients. Journal of Music Therapy, *33*, 2-18.
- Hamann, S.B., Cahill, L., McGaugh, J.L., & Squire, L.R. (1997). Intact enhancement of declarative memory for emotional material in amnesia. Learning & Memory, *4*, 301-309.
- Schlaug, G., Marchina, S., & Norton, A. (2008). From singing to speaking: Why singing may lead to recover of expressive language function in patients with Broca's aphasia. Music Perception, *25*, 315-323.
- Roy, M., Peretz, I., & Rainville, P. (2008). Emotional valence contributes to music-induced analgesia. Pain, *134*, 140-147.

April 22nd

Music and Society

- Stack, S., Gundlach, J., & Reeves, J.L. (1994). The heavy metal subculture and suicide. Suicide & Life-Threatening Behavior, *24*, 15-23.
- Alasdair, J.M. Forsyth, M.B., & McKeganey, N.P. (1997). Musical preference as an indicator of adolescent drug use. Addiction, *92*, 1317-1325.
- Johnson, J.D., Jackson, L.A., & Gatto, L. (1995). Violent attitudes and deferred academic aspirations: Deleterious effects of exposure to rap music. Basic and Applied Social Psychology, *16*, 27-41.
- Hansen, C.H. (1995). Predicting cognitive and behavioral effects of gangsta rap. Basic and Applied Social Psychology, *16*, 43-52.
- Johnson, J.D., Adams, M.S., Ashburn, L., & Reed, W. (1995). Differential gender effects of exposure to rap music on African American adolescents' acceptance of teen dating violence. Sex Roles, *33*, 597-605.
- Fischhoff, S.P. (1999). Gangsta' rap and a murder in Bakersfield. Journal of Applied Social Psychology, *29*, 795-805.
- Anderson, C.A., Carnagey, N.L., & Eubanks, J. (2003). Exposure to violent media: The effects of songs with violent lyrics on aggressive thoughts and feelings. Journal of Personality and Social Psychology, *84*, 960-971.

April 29th

Evolution

- McDermott, J. (2008). The evolution of music. Nature, *453*, 287-288.
- Patel, A. (2006). Musical rhythm, linguistic rhythm, and human evolution. Music Perception, *24*, 99-104.
- McDermott, J. & Hauser, M.D. (2007). Nonhuman primates prefer slow tempos but dislike music overall. Cognition, *104*, 654-668.
- Peretz, I. & Coltheart, M. (2003). Modularity of music processing. Nature Neuroscience, *6*, 688-691.
- Pfordresher, P.Q. & Brown, S. (2009). Enhanced production and perception of musical pitch in tone language speakers. Attention, Perception, & Psychophysics, *71*, 1385-1398.
- Trainor, L.J. (2006). Innateness, learning, and the difficulty of determining whether music is an evolutionary adaptation: A commentary on Justus & Hustler (2005) and McDermott & Hauser (2005). Music Perception, *24*, 105-110.

May 6th

Presentations

Short Written Assignment

As with every assignment this semester, my goal is to press you to think critically. On the surface, the topic for the short written assignment seems simple enough: Write about a song that you love and explain why you love it. However, experience tells me that your attitude will change when you actually sit down to write the paper. In past semesters, students have 'freaked out' when it came time to write, largely because the assignment provides little or no structure.

The reason to give you so much freedom is to give you experience floundering around in search of an interesting argument. Many times, you know what the professor wants to hear and you tailor your discussion to suit his/her agenda. I guarantee you that I have no agenda for this paper. I have no pre-conceived notions about what a good paper 'should' say. I want you to think long and hard about why you love your song so much. Is it the music, itself? Does the music remind you of a particular event or period of your life? Does the music reflect something important about you or your journey of self-actualization? You are free to cite relevant literature, but are not required to do so. Start thinking about what you song you will choose now; use spare moments to try to reconstruct what makes your song so likeable.

In addition to obliging you to think critically, I want to provide a respite to those of you who balk at the cognitive approach to studying music, that is breaking music down into its constituent components. This is your opportunity to redress this failing, to deal with music at whatever level you choose. Just be sure that your paper reflects a careful, reasoned, and insightful attempt to understand the factors related to musical preference.

Final Presentation Suggestions

The question of what would constitute a reasonable topic is always a tricky one for me. Students often complain if they aren't given a very specific question. However, when I give a very narrow topic to write about, students complain that it wasn't very interesting and they could have done a much better job if they could have written about something else. So, what to say about topics? I decided to provide a couple of suggested topics below to give you a sense of what a reasonable topic would sound like. In general, your paper can take any of three forms:

- A literature review in which you compare/contrast two different areas.
- A research proposal in which you describe an experiment that could be used to answer a burning question in the area of music psychology. Ideally, you would not only propose the experiment, but implement it and collect and report data, as well.
- You may - after consulting with me - take a different approach, but an acceptable topic must use the papers we discussed in class to address some other problem in the world.

Of these three possibilities, the second (research proposal/data collection) is **strongly** encouraged.

Advertising

How do marketers use music to sell products (Don't make this up, read some papers from the marketing literature)? What do these strategies fail to take into account about how people learn/remember music? What would be a good strategy if you wanted people to do the following: a) buy

your product, b) remember your brand name, c) forget your competitor's brand name, or d) discuss your product with friends? Obviously, you would not need to cover all of these questions.

Development

How is the development of musical ability analogous (or not) to the development of other physical or linguistic skills in infants? One way to proceed on this topic would be to read an introductory text on language to see what the different steps are in language acquisition and see if they map easily on to musical development?

Emotion/Preference

This area might be quite amenable to a research proposal. The papers we read in this area were not controlled as well as one might like. How might you do a better job of measuring what factors lead a person to like jazz over classical music? Or, what types of music instill different emotions? Don't be afraid to throw out a heretofore untested hypothesis like, perhaps, people who had very strict parents like more "rebellious" types of music. Just be sure that you can back up your hypothesis, preferably with published work.