

**MUSICCOG 3B03/PSYC 3MB3:  
Cognitive Development & Music Education  
(Winter 2011)**

Monday: 10:30-11:20; Thursday 9:30-11:20; TSH 321

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**Overview:** This course will explore a number of fascinating questions, including: How do children learn to “understand” music? What does it mean to “understand” music anyway? When does musical development begin? What is the relationship between language and music? Why does music regarded as “beautiful” in some cultures sound “painful” to our ears? Is western tonal music “better” than other forms of music? What is the best way to teach children music? Does music make us smarter?

**Course Objectives:** The objectives of this course are:

- 1) To survey and discuss research on the acquisition of musical ability.
- 2) Discuss ways in which this research can be used to help inform current musical practices
- 3) To build critical reading, writing, thinking, and research skills

**Required Text:** None. Readings will be posted to Avenue to Learn (ATL) for free download to all enrolled students.

**Prerequisites:** MUSICCOG 2A03 or PSYCH 2MA3 and registration in any Music Cognition program (B.A., B.Mus., B.Sc.) or Honours Music; or MUSICCOG 2A03 or PSYCH 2MA3, two of PSYCH 2D03, 2E03, 2F03, 2H03, 2NO3, 2TT3 and registration in any Honours program.

**Class Format:** This class will meet twice a week, once for 50 minutes (Mondays) and once for 110 minutes (Thursdays). This format is designed to promote extended and thought provoking discussions, in particular during the Thursday class. To this end, active participation by all students is essential.

**Course Requirements and Grading:**

**Exams (50%):** We will have two mid-term exams in the course. The first will be in class on February 10<sup>th</sup>, the second will be in class on March 24<sup>th</sup>. These exams will cover the first and second portion of the class respectively. The final will be at a time scheduled by the registrar. The exams will consist of free responses to questions distributed in advance. You are permitted (and encouraged) to work together in

preparation for your exams, however the exam itself must be completed on your own. Students are responsible for bringing paper to the exams on which to write responses. No notes are permitted when taking the examinations.

Exams in this course are graded anonymously. Therefore, it is imperative that you write your name on a blank page at the end of the exam (separate from any page on which there are answers that will be graded), rather than the front of the exam. Failure to facilitate anonymous grading will result in a deduction of up to 10 points.

If you experience a sudden medical condition that prohibits you from writing the exam, it is your responsibility to notify the instructor of this by email or phone prior to the exam itself. Under exceptional circumstances, this requirement may be waived provided a medical documentation is provided with 48 hours of the exam date. Please note that a doctor's note to the Dean's office does not exempt you from writing the exam, although medical documentation will be required of anyone requesting an alternate exam time.

**Final paper (40%):** As a “capstone” course, the major requirement will be a 15 page (double spaced, 12 point font) paper exploring a topic of the student's choice related to the cognitive development of musical capacities. Paper topics may align with those discussed in class, be completely independent of those discussed in class, or some combination of the two. Note that topics must be approved by the instructor beforehand. Ample time will be given in class to discuss paper topics and clarify expectations for this assignment. In addition to summarizing and synthesizing the relevant literature, the papers should include 2 well-thought-out experiments relevant to this topic. You are not actually required to run these experiments, but they should be theoretically possible for you to complete in a year, if you chose to do so.

To help prepare for this assignment, students will be required to submit a 1-paragraph summary including at least 3 references by Feb 3<sup>rd</sup>, and a one-page summary with 5 references by Feb 17<sup>th</sup>. The final paper will be due at the beginning of class on March 28<sup>th</sup>. Each student will also be given time to present the results of their paper during the last few weeks of class. This presentation will count as 10% of your final grade. Therefore, 40% of your final grade will be based on your paper, broken down into the following categories:

- Summary (5%): Due at the beginning of class on Feb 17<sup>th</sup>.
- Oral presentation (10%): In class during the last 3 weeks of the term (specific date TBD).
- Written paper (25%): Due at the beginning of class on March 28<sup>th</sup>.

To avoid the stress of procrastination, students will follow this timeline:

- **Jan 3-24<sup>th</sup>** Start think about potential topics. What aspects of cognitive development and music acquisition are you particular interested in? Try skimming through the syllabus and/or articles posted on the class website. Web surfing (in particular on Google Scholar or PsycInfo) can often be helpful in learning more about topics of interest.
- **Thursday, Jan 27<sup>th</sup>** We will have an in-class discussion of potential topics. Have at least 3 proposed topics ready for discussion. It is highly recommended that you

begin searching for literature on potential topics prior to this date so that you sure that there is sufficient research in this area.

- **Thursday, Feb 3<sup>rd</sup>**. Submit a one paragraph summary of your topic along with at least three references/citations, of which at least two are not on the class reading list.
- **Thursday, Feb 17<sup>th</sup>** Submit a one-page summary of your topic, including at least 5 citations/ references (at least four of which are not on the class reading list), as well as at least one proposed experiment on your topic. Note that this summary will be graded, and account for 5% of your final grade.

**Class participation (10%):** Thoughtful dialogue forms an essential component of mastering complex material. Consequently, active researchers generally attend several conferences each year to disseminate their research and learn from the feedback of their peers. In an effort draw on the academic benefits of such discussions, a substantial portion of our Thursday class will be devoted to active discussions both in small groups and amongst the entire class. To this end, class participation is an important component of the course, and factors directly into final grades. Participation involves two aspects:

1) Submitting weekly discussion material to the TA via email no later than noon on Wednesday. The email should include three items. The first two should be questions that you would like to discuss further in class, and the third item should be something from the reading that you would like further clarification about. If you felt comfortable with all of the week's readings, it is also acceptable to submit three questions that you would like to discuss further and omit any mention of points on which you would like clarification. Please include "MUSICCOG 3MB3" in the subject line of your message to assist the TA with email management. Note that it is not the TA's job to "remind you" if you have not submitted a discussion question in time – it is your responsibility to manage your time for this task. Please do NOT email these items to the instructor.

2) Active participation in weekly class discussions. This includes contributing to discussions as well as actively listening to your peers.

The purpose of this component of the course is to (a) give you an opportunity to critically reflect on the readings/topics prior to class, so that you arrive ready to contribute to discussions, (b) allow students to take an active role in shaping the course narrative, and (c) to give you practice in discussing research with your peers.

**Policy for Written Work:** Work should be submitted in class on the day that it is due. Late work (not submitted during the specified class), should be turned into the SOTA office – 414 TSH (note that the office is open 9-12 and 1-4). Late assignments will not be accepted via email without special prior arrangements. Late work is subject to a penalty of 3% per calendar day (i.e., an assignment due on Thursday submitted the following Monday would receive a deduction of 12%).

**Email Policy:** In the 21<sup>st</sup> century, email has become an important form of communication. If you are uncomfortable with email and/or do not regularly check it,

this is a great time to start. You will be responsible for all information sent via email, as it is the preferred form of communication for the course.

It is the policy of the Faculty of Humanities that all email communication between students and instructors (including TAs) must originate from their official McMaster University email accounts. This policy protects the confidentiality and sensitivity of information and confirms the identities of both the student and instructor. The School of the Arts' instructors will delete messages that do not originate from McMaster email accounts.

**Grading Scale:**

(may change based on circumstances but not without prior mention in class)

Exams I	15%
Exam II	15%
Final Exam	20%
Participation	10%
Final paper project	40%

Grading for the class will be done according to the official McMaster University grading scale. Please note that “excellent” assignments warrant a grade of “A,” corresponding to a numeric value of 85-89. Only “outstanding” assignments warrant a grade of “A+,” in the range of 90-100. I suggest spending some time thinking about the grade you would like to achieve, and then reflect on the quality of the assignments you should submit in order to achieve this grade.

Grade	Equivalent Grade Point	Equivalent Percentages
A+	12	90-100
A	11	85-89
A-	10	80-84
B+	9	77-79
B	8	73-76
B-	7	70-72
C+	6	67-69
C	5	63-66
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52
F	0	0-49 – Failure

Note: In order to assist with creating a class environment filled with student-directed discussions, please complete readings by the date listed on this schedule. The readings for each week are centered around “key questions.” I strongly suggest you keep these questions in mind as you do the weekly readings, and use them to guide your understanding of the material.

### **Week 1 – Enculturation**

*Key questions: How do children “learn music” even before they receive formal instruction? Does our early experience as infants affect the way we view the world as adults? Are cross-cultural differences rooted in genetic or environmental factors?*

Monday, Jan 3<sup>rd</sup> Introduction and Overview  
<no required readings>

Thursday, Jan 6<sup>th</sup> Enculturation

- Hannon, E., & Trehub, S. (2005). Metrical categories in infancy and adulthood. *Psychological Science*, 16, 48- 55.
- Lynch, M., Eilers, R. , Oller, K., & Urbano, R. (1990). Innateness, experience, and music perception. *Psychological Science*, 1, 1990. 272-276.

### **Week 2 – The Evolution of Musical Capacity**

*Key questions: Why do humans have the cognitive capacity for music? Is music an evolutionary adaptation (i.e., a target of natural selection), or an evolutionary accident? Can animals listen to music, or is it a uniquely human endeavor?*

Monday, Jan 10<sup>th</sup>

- Wright, Rivera, Julse, Shyan & Neiworth (2000). Music perception and octave generalization in rhesus monkeys. *Journal of Experimental Psychology: General*, 129, 291-307.

Thursday, Jan 13<sup>th</sup>

- McDermott & Hauser. (2004). Are consonant intervals music to their ears? Spontaneous acoustic preferences in a nonhuman primate. *Cognition*, 94, B11-B21
- Masataka, N. (2006). Preference for consonance over dissonance by hearing newborns of deaf parents and of hearing parents. *Developmental Science*, 9, 46-50.

**Week 3 – In the beginning:  
Infant directed speech and neo-natal listening**

*Why do we speak to infants with high-pitched voices? Do early mother-infant interactions affect the way we listen to Mozart and Metallica? Can infants begin “hearing” music before they are born, and if so how does this shape their musical preferences?*

Monday, Jan 17<sup>th</sup>

- Mithen (2006). Talking and Singing to Baby (*Singing Neanderthals*, ch 6)

Thursday, Jan 20<sup>st</sup>

- Trehub & Nakata (2001-02). Emotion and Music in Infancy. *Music Scientia*, 37-61
- James, Spencer & Stepsis (2002). Fetal learning: A prospective randomized controlled study. *Ultrasound in Obstetrics and Gynecology*, 20, 431-438.

**Week 4 – Development I:  
Perceiving pitch & Recognizing melody**

*Do infants learn some musical intervals (i.e. perfect 5<sup>th</sup>, minor 2<sup>nd</sup>) earlier than others? Can infants recognize melodies? How do we really know what infants are hearing anyway? When do children start to develop as musical listeners?*

Monday, Jan 24<sup>th</sup>

- Schellenberg, E. G., & Trehub, S. E. (1996). Natural musical intervals: Evidence from infant listeners. *Psychological Science*, 7, 272-277.

Thursday, Jan 27<sup>th</sup>

- Schellenberg, E. G., & Trehub, S. E. (1996). Children's discrimination of melodic intervals. *Developmental Psychology*, 32, 1039-1050.
- Trehub, S. E., Bull, D., & Thorpe, L. A. (1984). Infants' perception of melodies: The role of melodic contour. *Child Development*, 55, 821-830.

## **Week 5 – Development II: Learning scales and tonal hierarchy**

*Can infants understand harmonic progressions? How do infants become enculturated in a musical system? Why are major scales constructed the way they are? How does our understanding of harmony and tonality evolve over our lifespan?*

Monday, Jan 31<sup>st</sup>

- Trehub, S. E., Schellenberg, E. G., & Kamenetsky, S. B. (1999). Infants' and adults' perception of scale structure. *Journal of Experimental Psychology: Human Perception and Performance*, 25, 965-975
- Trainor, L. & Trehub, S. (1992). A comparison of infants' and adults' sensitivity to Western musical structure. *Journal of Experimental Psychology: Human Perception and Performance*, 18, 394-402

Thursday, Feb 3<sup>rd</sup>

- Trainor, L. J., & Trehub, S. E. (1994). Key membership and implied harmony in Western tonal music: Developmental perspectives. *Perception & Psychophysics*, 56, 125-132
- Krumhansl C., & Keil, F. (1982). Acquisition of the hierarchy of tonal functions in music. *Memory and Cognition*, 10, 243-251.

## **Week 6 – Music and Language**

*Does our native language influence the kinds of music composers compose? Does our native language influence the kinds of music listeners enjoy listening to? Can we truly “understand” music from other cultures? What does it mean to “understand” music anyway?*

\*\*\*\* GUEST LECTURE BY KATE EINARSON\*\*\*\*

- Patel, A., & Daniele, J. (2003). An empirical comparison of rhythm in language and music. *Cognition*, 87, 35-45.

Thursday, Feb 10<sup>th</sup>

**Exam I (in class)**

Note: Readings and topics for the second half of the class may change based upon the availability and wishes of some potential guest lecturers. Therefore, this list is included now more to give a preview of the likely topics than the exact order and article that will be read.

**Week 7 – Development IV:  
Learning rhythm and meter**

*Why do we often “move to the beat” when listening to music? Are the ways in which we group notes into rhythms universal, and if not what factors play into this seemingly simple task? How do we learn to temporally group individual notes into a robust metrical structure?*

Monday, Feb 14<sup>nd</sup>

- Phillips-Silver, J. & Trainor, L. (2007). Hearing what the body feels: Auditory encoding of rhythmic movement. *Cognition*, 105, 533-546.

Thursday, Feb 17<sup>th</sup>

- Bergeson, T. & Trehub, S. (2006). Infants' perception of rhythmic patterns. *Music Perception*, 23, 345-360.

\*\*\*\* GUEST LECTURE BY DR. SANDRA TREHUB \*\*\*\*

Reading week (no class on Feb 21<sup>th</sup> or Feb 24<sup>th</sup>)

**Week 8 – Development III:  
Absolute pitch, relative pitch, and statistical learning**

*Why do some people have “absolute pitch,” allowing them to the pitch of most any sound? Why don't all people have perfect pitch? When infants encode melodies, are they using absolute or relative pitch? How do we learn the structure and grammar of music even without formal study of music theory?*

Monday, Feb 28<sup>th</sup>

- Saffran, J., Jonson, E., Aslin, R., Newport, E. (1999). Statistical learning of tone sequences by human infants and adults. *Cognition*, 70, 27-52.

Thursday, March 3<sup>rd</sup>

- Saffran, J., Reeck, K., Neibuhr, A., & Wilson, D. (2005). Changing the tune: the structure of the input affects infants' use of absolute and relative pitch. *Developmental Science*, 8, 1-7.
- Schellenberg, G. & Trehub, S. (2003). Good pitch memory is widespread. *Psychological Science*, 14, 262-266.



## **Week 9 – Music and Cognitive Abilities:**

### **Does music “make you smarter”?**

*What is the “Mozart Effect” and does it in fact show that music makes us smarter? How did this controversy begin, and what is the role of scientific research in guiding educational policy? What exactly is the relationship between music and intelligence – is it causal? correlational? Non-existent?*

Monday, March 7<sup>th</sup>

- Rauscher, F., Shaw, G., & Ky., Katherine (1993). Music and spatial task performance. *Nature*, 365, 611.
- Thompson, W., Schellenberg, E., & Husain, G. (2001). Arousal, mood, and the Mozart effect. *Psychological Science*, 12, 248-251

Thursday, March 10<sup>th</sup>

- Schellenberg, G. (2004). Music lessons enhance IQ. *Psychological Science*, 15, 511-514.
- Schellenberg (2006) - Long Term Positive Associations Between Music Lessons and IQ. *Journal of Educational Psychology*, 98, 457-468.

\*\*\*\* GUEST LECTURE BY DR. GLEN SHELLENBERG (tentative) \*\*\*\*

## **Week 10 – Emotion and Music**

Monday, March 14<sup>st</sup>

- Adachi, M. & Trehub, S. (2000 ). Decoding the expressive intentions in children’s songs. *Music Perception*, 18, 213-224.
- Morton, J. & Trehub, S. (2007). Children’s judgments of emotion in song. *Psychology of Music*, 35, 629-639.

Thursday, March 17<sup>th</sup>: *Student presentations*

## **Week 11 – Presentations**

Monday, March 21<sup>st</sup>: *Student presentations*

Thursday, March 24<sup>th</sup>: **Exam II**

## **Week 12 – Student Presentations**

Monday, March 28<sup>th</sup>: *Student presentations*

Thursday, March 31<sup>st</sup>: *Student presentations*

## **Week 13 – Student Presentations**

Monday, April 5<sup>th</sup>: *Student presentations*