

The Bilingual Brain
Professor Laura-Ann Petitto
PSYD25
Winter Term 2011
University of Toronto Scarborough

Professor: Dr. Laura-Ann Petitto

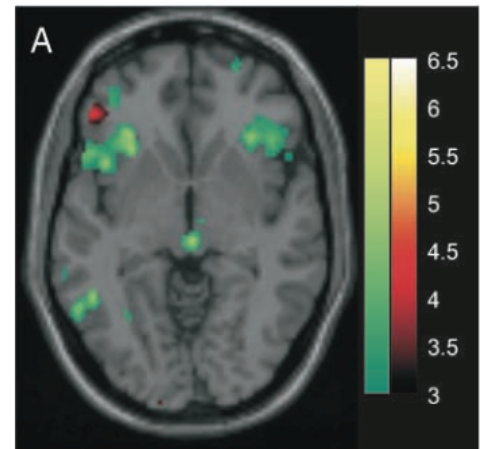
Office: New Science Building, SY122

Class Times: Tuesdays, 3:00pm to 5:00pm in MW264

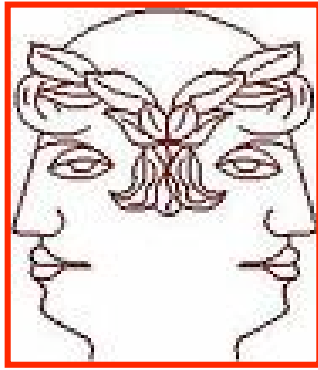
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Office Hours: Tuesdays, 11:00am-12:00pm in SY122



COURSE DESCRIPTION What happens when one brain contains two languages, or three, or even more? Do Bilinguals think differently than monolinguals? What's the relationship between thought and language when using two languages as compared to one? Do bilinguals see the world differently? Are bilinguals "smarter?" We will discover the answers to these questions, and more. The human mind with multiple languages will be explored from the new lens afforded by the world's most advanced neuroimaging technology to look inside the brain, including PET, fMRI, ERP, and fNIRS. We will unravel key concepts in contemporary science about the brain and its capacity to learn, including innateness, environmental, and epigenetic influences on learning in development, critical and sensitive period hypotheses, lateralization, plasticity, and hemispheric specialization. We will evaluate paradoxical views about bilinguals held in society, including claims that have garnered dazzling positive media attention (e.g., "bilinguals are smarter") and compare these claims to other negative views that have led to public referenda in various countries around the world to ban bilingualism. Overall, you will discover the theories, methods, and analytical reasoning skills in science that, together, permit such seemingly intractable questions about the bilingual brain, dual language processing, and thinking in two languages to be laid bare.



REQUIRED READINGS

The readings can be found on Blackboard.

BLACKBOARD

You will post questions related to your student-led class presentations and debates on Blackboard. Please use the “Discussion Board” feature. Questions for student-led class discussion and debates must be posted no later than Wednesday night (midnight) the week before you present. Blackboard will also be a vital “virtual classroom” where class members may ask and answer each other’s questions. Please familiarize yourself with Blackboard and get in the habit of checking it regularly. Note: Please use email (as opposed to Blackboard) for any

direct questions for and/or communications with me (Professor Petitto).

COURSE STRUCTURE

This course is designed to embrace and incorporate the most contemporary understanding of psychological principles of human learning and memory, involving, for example, how we learn best, how we remember best, and how we learn for life. Lecturing will be kept at a minimum. On many days, the class will consist of student-led discussions and debates with the goal of promoting meaningful understanding, critical thinking, and deep learning of the material for life.

OBJECTIVES

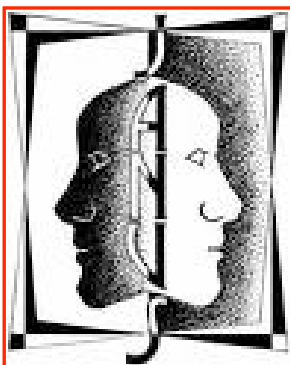
My primary objectives are to provide the most cutting-edge knowledge on our topics to date and to communicate this knowledge in the most meaningful, mutually interactive, respectful, and fascinating ways. Your primary objectives are to think deeply about the material, to develop critical reasoning skills, and to learn the material in a way that stays with you for life.

RESPONSIBILITIES

I have a genuine passion for teaching and, as such, I try to create ways to convey key course material so that you will remember it for always. To benefit fully from these techniques it is your responsibility to (i) read every assigned reading on time, (ii) attend classes and fully participate in the activities, evaluations, discussions, and debates, (iii) hand in Reflection Papers at the beginning of each class (except for the class in which you present); do monitor Blackboard for class questions/announcements/developments, (iv) lead a class and its debate, (v) write a final paper.

GRADING POLICY

| | | |
|-------|---|-----|
| (i) | Reflection Papers | 20% |
| (ii) | Class Attendance, Class Participation, Peer-Evaluations | 15% |
| (iii) | Two Oral Presentations of Research Proposal Topic | 15% |
| (iv) | Discussion and <u>Debate</u> Leadership | 25% |
| (v) | Research Proposal | 25% |



- (i) Reflection Papers (Do not hand in for week that you are leading the class.)
- Goal: To promote your critical analysis skills and ability to synthesize disparate ideas into an elegant, unified argument in science. To promote exciting discussion, and to convince me that you have read and understood the paper(s).
 - How: The content of this paper should include (a) an exceedingly brief statement of the overarching question/finding of EACH of the articles assigned (e.g., not more than 1-2 sentences max per assigned article), which is presented in such a way so as to be an

integration/synthesis of the articles' themes and/or shared findings (not a literal list of each paper read). Said another way, do not waste space summarizing each and every article. Provide a (b) critique/analysis of the findings and/or a critique/analysis of the author(s)' interpretation(s) of findings; and, (c) where relevant, this may include your discussion of an alternative idea or an alternative study/design. Do be sure to focus on your important critique and analysis of the ideas in the papers (sections (b) and (c) above).

- Format: One page MAXIMUM, spaced with 1.5 line spacing, 1" margins, 12-point "normal" font (such as, Arial, Times). Separately, you may include an additional page for References (should you read any additional articles; this is optional and non-required). Strict adherence to this page limit is obligatory. "Less is more." Eloquence of mind and the idea in science = stunning clarity with equally stunning brevity. Again, one page @ 1.5 line spacing.

(ii) Class Attendance, Class Participation, Peer-Evaluations

- Goal: To ensure rich individual learning and rich group discussion
- How: Good participation includes coming to class (and coming on time), general willingness to participate in discussion, class activities, and debates, a respectful and kind manner towards the contributions of others, and offering constructive comments, feedback, and questions. You will also be asked to provide constructive peer-evaluation of particular presentations throughout the semester. Together, these indices will constitute your total Class Attendance/Class Participation grade.

(iii) Two Oral Presentations of Research Proposal Topic

You will be presenting your research proposal topic twice in the class. Each time, you will provide a PowerPoint file containing 4 slides (which you will send to a class volunteer) four (4) days before the presentation that will be compiled into a master class PowerPoint presentation (label your file as follows: Last name.first name.ppt, as in, Petitto.Laura-Ann.ppt). Students will present from this class master PowerPoint file in turn, in alphabetical order.

Slide 1 Title, Your Name, Question & Rationale

Slide 2 Background and Hypotheses (Predictions)

Slide 3 Participants, Methods, Conditions

Slide 4 Expected Results

You will have 4 minutes to present, with 4 minutes for discussion (T=8 minutes). Time yourself.

You will be asked to stop after 4 minutes.



(iv) Discussion and Debate Leadership

- Goal: To promote outstanding reasoning abilities, life-long learning, and exciting discussion; to promote more in-depth learning of specific course topics.
- How: Students will be selected by lottery to be a Discussion and Debate Leader for each of the student-led classes listed below. Discussion/Debate Leaders will (a) present a brief summary of the weekly readings, with the addition of the ONE outside reading of your choice, and (b) lead a creative and exciting class debate. Within your presentation, and during your initial summary of the week's readings, please be sure to identify the outside reading to the class/me, making connections gained

by its inclusion. Your class Debate/Discussion Questions must be posted by Thursday night (midnight) of the preceding week.

- Format

Part A. Brief and Creative Discussion of the Week's Readings. Please present this discussion/summary portion of your presentation creatively. For example, use PowerPoint in

visually informative and creative ways, present material in a manner that pushes class members to new conceptual understanding, send questions ahead of time via Blackboard to the class for reflection, pose questions to the group in class, break class into smaller groups to discuss the questions that you provided about the readings, provide novel examples, provide links and connections to issues that have been in the public media. Do make connections and links from science to society!

Part B. The Debate. I provide debate questions for each topic within. It is intended that you will use this question as the basis of the debate that you lead. Any changes to the basic question proposed must first be finalized in consultation with me and then posted on Blackboard by Wednesday night (midnight) before your Monday presentation/debate. Please, to be most respectful to your peers who are presenting, do not engage in a discussion of the Debate question on Blackboard prior to a given class. The first discussion of a specific debate question for a given class must be done only within the class. Later, after class, continuing discussion and analysis may occur for a preceding week's debate question that has already been aired. NOTE: Students in the class will be randomly assigned to debate sides, Pro & Con, and, thus, this is yet another reason why it will be important to come to class with all of the assigned readings completed. Thank you!



Checklist of Things to Do Before your Discussion/Debate

- Teams must meet with me during my office hours at least ONE week before your presentation. This is absolutely imperative.
- Teams must meet together before your actual class presentation and practice. Presentations must be intelligent, creative, well-planned, well-balanced. Please, this is teamwork. Help one another!
- PowerPoint slides and/or handouts must be posted on Blackboard for the entire class no later than midnight on the day that you presented (here, Tuesdays, midnight), plus, please send a copy to me via email. If your slides are available several hours before your actual class presentation, this is even better.

(v) Final Research Proposal (due April 5, 2011)

- Goal: To apply all that you learned throughout the course by writing a Research Proposal on a topic of your choice. *However, the Proposal may not be on the same topic for which you led your class discussion and debate.*
- How: Your Research Proposal should contain the following parts and in this order: Cover Page, Abstract Page, Text (no more than 8 pages, double-spaced; see format), and References (no limit). The "Text" component of this paper should contain the following parts and in this order: Question, Rationale (why important; who cares?), Background, Hypotheses and Predictions, Participants, Methods, Analyses, and Results (i.e., the expected research results as per each of your Hypotheses/Predictions), Discussion, and Conclusion (in which the significance/advance of your particular study is highly apparent relative to each of your possible expected outcomes), plus References. (Research Proposals must follow APA guidelines.)

Note about References: There must also be at least ten (10) outside references that you have personally read towards the completion of your final document. References from Wikipedia, Dictionary.com, or any non-peer reviewed journal will not be accepted.

Format: Use APA style. Research Proposals may not exceed 8 (eight) pages of text, double-spaced. Cover page, Abstract, and References constitute separate pages and are separate from the Text page count. References have no page limit. Use at least 1-inch margins, and "normal" font (e.g., Arial, Times, 12-point font).

Writing a Paper in Psychological Science: If you have never written a paper in Psychology before, please make an appointment in the writing center to master APA style.

- When: See below for dates associated with our class discussion of your Research Proposal topic.

LATENESS POLICY

Lateness is not acceptable unless there is an officially documented medical or personal emergency. Late items will be docked 10% for each day late. Final Research Papers are due on March 29, 2010 @ 10:00am.

STUDENTS WITH DISABILITIES

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. The UTSC AccessAbility Services staff (located in S302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or ability@utsc.utoronto.ca. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.



EMAIL POLICY

I do my best to answer email promptly but, alas, my daily volume is painfully high. I welcome you to stop by my office hours. Should a question come up, I encourage you first to read the syllabus and our Blackboard site, try asking a classmate, and/or to post your question on the class Discussion Board. You'd be surprised to see how many times our questions are shared by other classmates. If the above doesn't work, either send an email or come to my office hours.

CLASS TOPICS & READINGS
 * = Student-Led Debates/Discussion

| Class | Class Date | Topic of Class | Actions |
|-------|------------|--|--|
| 1 | Jan 11 | <p>Welcome to Class! Introduction: Myths & Truths about Bilinguals and Bilingualism</p> <p>SEE also Petitto's website. General: http://www.utsc.utoronto.ca/~petitto/index.php and specifically, Bilingualism: http://www.utsc.utoronto.ca/%7Epetitto/lab-info-BilingualismAndEarlyBrainDevelopment.php</p> | <p>Lottery!</p> <p>Begin to notice the topic of Bilingualism in the world around you - newspaper articles, radio & TV shows, educational pamphlets, dinner party conversations, Dorm room debates. The topic is everywhere. Bring the articles in. Begin to connect the class' science with society.</p> <p>Take a look at blog from Françoise Grosjean (regarding his new book <i>Bilingual: Life and Reality</i>) August 18, 2010: http://harvardpress.typepad.com/hup_publicity/2010/07/what-bilingualism-is-not-.html (or read his book for enjoyment!)</p> <p>Drop in on Montreal newspapers from the English side (Gazette) and/or from the French side La Presse and Le Devoir.</p> |
| 2 | Jan 18 | <p>Introduction to Language, the Brain, and the Bilingual Brain</p> <p>Neuroanatomy Primer</p> <p>Theories regarding language specialization in the human brain (monolingual and bilingual)</p> <p>Methods in studying language specialization in the mono/bilingual brain</p> <p>New perspectives from cross-modal bilinguals (exciting insights into the brain from signing and speaking bilinguals)</p> | <p><u>Hand in:</u> Reflection Paper</p> <p><u>Read:</u></p> <ul style="list-style-type: none"> • Shalinsky et al., (2009) • Kuhl & Rivera-Gaxiola, (2008) • Perani et al., (1998) • Mehler & Christophe (2000) <p>Optional: Weber-Fox & Neville (1996)</p> |
| *3 | Jan 25 | <p>When young children are exposed to two languages in early life.</p> <p>Part I: Babbling, Early Phonology, and Typical Bilingual Language Development</p> <p><u>Debate Topic:</u> Very early bilingual language exposure yields developmental differences and</p> | <p><u>Hand in:</u> Reflection Paper</p> <p><u>Read:</u></p> <ul style="list-style-type: none"> • Phono in Bilingual Infants: Petitto et al. (In Press) • Babbling (Hint: Note these children's language |

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| | | deviance | backgrounds): Petitto, Holowka, Sergio, & Ostry, (2001); and <u>View</u> : Maximum Science video (see Biblio below) <ul style="list-style-type: none"> • Petitto & Kovelman (2003). <i>Optional</i> : Bosch & Sebastian-Galles (2003) |
| *4 | Feb 1 | When young children are exposed to two languages in early life. Part II: Overall Maturational Timing Milestones across development in bilingual and monolingual children <u>Debate Topic</u> : Very early bilingual language exposure causes language delay and confusion | <u>Hand in</u> : Reflection Paper <u>Read</u> : <ul style="list-style-type: none"> • Timing Milestones: Petitto, Katerelos, et al., (2001) • Early meanings: Holowka, Brosseau-Lapr e, & Petitto, (2002) • Chumak-Horbatsch, (2008) |
| *5 | Feb 8 | When young children are exposed to two languages through print in early life Is there a Bilingual <u>Reading</u> Advantage? <u>Debate Topic</u> : Very early bilingual exposure to two reading systems at the same time causes reading delay and confusion | <u>Hand in</u> : Reflection Paper <u>Read</u> : <ul style="list-style-type: none"> • Kovelman, Baker, & Petitto (2008, a) • Norton, Kovelman, & Petitto (2007); not about bilinguals but the theoretical issues are deeply apt • Chee (2005) |
| *6 | Feb 15 | When bilingual adults process their two languages – Bilingual and Monolingual Brains Compared <u>Debate Topic</u> : Bilingual and monolingual language and thought processes are fundamentally different | <u>Hand in</u> : Reflection Paper <u>Read</u> : <ul style="list-style-type: none"> • Kovelman, Baker, & Petitto, (2008, b) • Kovelman, Shalinsky, Berens, & Petitto, (2008) • Kovelman...Petitto, (2009) • Chee, Siong-Soon, Lee, & Pallier, (2004) |
| | Feb 22 | Reading Week: No classes | |
| *7 | Mar 1 | Bilingual children and adults’ performance on select higher cognitive tasks Is there a Bilingual <u>Cognitive</u> Advantage? <u>Debate Topic</u> : Bilinguals are “smarter” than age-matched monolinguals | <u>Hand in</u> : Reflection Paper <u>Read</u> : <ul style="list-style-type: none"> • Bialystok, (2007) • Bialystok, Craik, & Ryan, (2006) • Morton & Harper, (2007) |
| *8 | Mar 8 | FIRST PRESENTATION: Present your planned paper ideas at 4 minutes per presentation (time yourself), with 4 minutes for class questions & answers (T=8 minutes per presentation). Out of respect for your peers, please plan on keeping to this | <u>Hand in</u> : Bibliography of at least 10 references <u>Read</u> : Continue reading, writing, editing your Research Paper |

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| | | timetable. See (iii) above for format information. | <u>Hand in (during class):</u> Peer-Evaluation Form for each presenter |
| *9 | Mar 15 | <p>Society and the Paradoxical views of Bilingualism</p> <p>Case Studies Belgium Ireland, Hong Kong, China, The Commonwealth of Massachusetts, USA</p> <p><u>Debate Topic:</u> The November 2004 public referendum in Massachusetts was correct in banning (abolishing) bilingual education (Hint: Know well Ron Unz’s “English for the Children,” California Proposition 227. Know also the public debate at Harvard University between Ron Unz and Catherine Snow, Nov 2004. Think about this: After taking this class, what information could have been added from the research on bilingual language development, cognition, reading, and brain organization that could have strengthen the Pro and/or the Con arguments.</p> | <p><u>Hand in:</u> Reflection Paper</p> <p><u>Read:</u></p> <ul style="list-style-type: none"> • Petitto, L.A. (2009) (International Journal of Mind, Brain and Education) • TBA <p>—</p> <p><u>Search the Media, for example:</u></p> <ul style="list-style-type: none"> • Daley, Suzanne (The New York Times, July 16, 2010); see references. Edwards, E. (Irish Times, 2008) • The Economist, about Hong Kong’s experiments with different Bilingual techniques (Spring 2008) <p><u>Must read</u></p> <ul style="list-style-type: none"> • Ron Unz & Catherine Snow Debate • Ron Unz and his campaign for Proposition 227 • Ron Unz “English for the Children” movement |
| 10 | Mar 22 | PREPARE FINAL PRESENTATION & RESEARCH PROPOSAL | PREPARE FINAL PRESENTATION |
| *11 | Mar 29 | <p>FINAL PRESENTATION: Present your final Research Proposal final content at 4 minutes (time yourself), with 4 minutes for class questions & answers (T=8 minutes per presentation). Polished, articulate oral presentations are expected with visually compelling slides. <i>Please do not read from slides or notes.</i> Professionalism and APA-style/format are a must. This is your last chance to receive feedback and to make modifications to your Research Proposal prior to handing it in next week.</p> | <p><u>Hand in (during class):</u> Peer-Evaluation Form for each presenter</p> <p><u>Read:</u> Continue reading, writing, editing your Research Proposal with at least 10 references</p> |
| 12 | Apr 5 | <p>Summary & Integration</p> <ul style="list-style-type: none"> • The bilingual brain reconsidered! • New knowledge about the bilingual brain and its implications for Society! | <p><u>Hand in:</u> Final Research Proposal due today upon entering the class. No late papers please.</p> <p><u>Hand in (during class):</u> Course Evaluations</p> |

Bibliography

(Plus your minimum of 10 readings for your Final paper and the additional reading for your Presentation/Debate)

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- Bialystok, E., Craik, F.I.M., & Ryan, J. (2006). Executive control in a modified antisaccade task: Effects of aging and bilingualism. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 32(6), 1341-1354.
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- Kovelman, I., Baker, S.A., & Petitto, L.A. (2008, b). Bilingual and Monolingual brains compared: An fMRI investigation of syntactic processing and a possible "neural signature" of bilingualism. *Journal of Cognitive Neuroscience*, 20(1), 153-169.
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- Kuhl, P. and Rivera-Gaxiola, M. (2008). Neural substrates of language acquisition. *Annual Review of Neuroscience Annual Review of Neuroscience Vol. 31: 511-534* (Volume publication date July 2008)
- Maximum Science Documentary (Petitto *Nature*)
http://video.google.com/videoplay?docid=8832999562201431834&ei=a_4qS5XBKZ7cqALRvoTKBQ&q=laura+ann+petitto&hl=en&client=safari#
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