

Syllabus
Bilingualism (UN3260)

Instructor: Michele Miozzo (mm1150@columbia.edu)
Office Hours: By appointment
Time: Tuesday 4:10-6:00pm
Location: 327 Uris Hall
Credits: Four

Course Description

Many of us know a second language. How we use it varies – some use it occasionally, others routinely. Recent research in cognitive neuroscience has shed light on the mechanisms associated with different forms of bilingualism. This research has considerably improved our understanding of how young infants learn the languages spoken in their environment, how one language does not interfere with the other while speaking or reading, or how bilinguals can switch between languages. Recent research in cognitive neuroscience has also shown that using two languages affects a variety of cognitive abilities, starting in infancy and continuing into an old age. The primary findings of recent research in cognitive neuroscience are reviewed and discussed in this course. Bilingualism also has a political facet – governments decide which languages are used in public institutions and taught in schools. This course also evaluates scientific findings on bilingualism and their potential implications for informing parents, educators, and policymakers.

Course Objectives

The objectives of this course can be summarized as follows: (a) gaining exposure to research in various fields of cognitive neuroscience; (b) becoming familiar with different methodologies and their applications; (c) strengthening the skills required to analyze and evaluate scientific results; (d) exploring the implications of scientific findings in everyday life.

Pre-requisites

An introductory course in psychology or biology; students who have not met this prerequisite but who have taken other relevant courses should contact the instructor.

Requirements

Attendance at each class and active involvement in class discussions are expected of all students. In most classes, students will participate in the discussion of the scientific articles assigned for the class. Students are expected to read the assigned articles and to respond to five questions related to the methods and findings of the research reported in the articles. These questions aim to help students understand the logic of the methods and to identify the major findings reported in the articles.

Three classes (4, 7, and 12) are devoted to science outreach. For each of these classes, students produce a piece of work whose objective is to communicate the scientific findings reviewed in the course to people who would benefit from these findings – e.g., parents, teachers, or policymakers. Findings are communicated in different ways across classes. For example, in one class students create a brochure for parents to receive at birth centers; in another class, the assignment consists of providing suggestions on second-language instruction to schoolteachers.

Students submit their work two days before the class (deadline: Sunday at midnight). Each student reviews the work submitted by another student (students have two days to complete the review). Works and reviews are presented and discussed in class.

For their final assignment, submitted at the end of the course, students present a proposal for a book on bilingualism. The book aims to communicate scientific findings on bilingualism to the general public, highlighting what scientists have learned about the effects of bilingualism on brain organization and cognitive control. In the proposal, students describe the book's content and explain why the proposal satisfies the goals of the editorial project. Guidelines on how to complete the assignment are provided to students. The proposal should be about 10 page long, double spaced.

Grading

The final grade is determined as follows:

- participation in class discussion, 15%
- responses to questions concerning the readings, 20%
- science outreach activities, 35%
- final assignment (book proposal), 30%

If a student needs to miss a class or hand in an assignment late, they are asked to email Prof. Miozzo to arrange an alternative assignment for that week. Missing more than one class or multiple assignments could result in a failing grade, so please get in touch with Prof. Miozzo if you anticipate any difficulties meeting the course requirements.

Course Schedule

Class 1 (Sept 8): Course introduction

Class 2 (Sept 15): How newborns discover multiple languages

Readings:

- Gervain, J., & Mehler, J. (2010). Speech perception and language acquisition in the first year of life. *Annual Review of Psychology*, 61, 191-218.
- Bosch, L., & Sebastián-Gallés, N. (2001). Evidence of early language discrimination abilities in infants from bilingual environments. *Infancy*, 2(1), 29-49.
- Byers-Heinlein, K., Burns, T. C., & Werker, J. F. (2010). The roots of bilingualism in newborns. *Psychological Science*, 21(3), 343-348.

Class 3 (Sept 22): How bilingualism sculpts the infant's mind

Readings:

- Kovács, Á. M., & Mehler, J. (2009). Cognitive gains in 7-month-old bilingual infants. *Proceedings of the National Academy of Sciences*, 106(16), 6556-6560.
- Hoff, E., Core, C., Place, S., Rumiche, R., Señor, M., & Parra, M. (2012). Dual language exposure and early bilingual development. *Journal of Child Language*, 39(1), 1-27.
- Yu, C. L., Kovelman, I., & Wellman, H. M. (2021). How bilingualism informs theory of mind development. *Child Development Perspectives*, 15(3), 154-159.

Class 4 (Sept 29): Beyond the lab: Science outreach activity

Bilingualism: A short guide for bilingual parents

Students are required to create a brochure that bilingual parents will find in birth centers and doctor offices. The brochure aims to explain to parents how infants discover multiple languages and the effects that the exposure to multiple languages could have on child's early development. The content of the brochure is based on recent scientific findings on bilingual acquisition.

Class 5 (Oct 6): Critical periods

Readings:

- Werker, J. F., & Hensch, T. K. (2015). Critical periods in speech perception: new directions. *Annual Review of Psychology*, 66(1), 173-196.
- Hakuta, K., Bialystok, E., & Wiley, E. (2003). Critical evidence: A test of the critical-period hypothesis for second-language acquisition. *Psychological Science*, 14(1), 31-38.
- Hartshorne, J. K., Tenenbaum, J. B., & Pinker, S. (2018). A critical period for second language acquisition: Evidence from 2/3 million English speakers. *Cognition*, 177, 263-277.

Class 6 (Oct 13): If you do not use it, you lose it

Readings:

- Mägiste, E. (1979). The competing language systems of the multilingual: A developmental study of decoding and encoding processes. *Journal of Verbal Learning and Verbal Behavior*, 18(1), 79-89.
- Ventureyra, V. A., Pallier, C., & Yoo, H. Y. (2004). The loss of first language phonetic perception in adopted Koreans. *Journal of Neurolinguistics*, 17(1), 79-91.
- Pierce, L. J., Klein, D., Chen, J. K., Delcenserie, A., & Genesee, F. (2014). Mapping the unconscious maintenance of a lost first language. *Proceedings of the National Academy of Sciences*, 111(48), 17314-17319.

Class 7 (Oct 20): Beyond the lab: Science outreach activity

Teaching a second language: Insights from science

In this assignment, students present recommendations concerning the objectives and methods of second language learning in primary and secondary school. These recommendations will be offered to teachers and will be based on scientific findings on bilingual acquisition.

Class 8 (Oct 27): How do we manage two languages when we speak?

Readings:

- Colomé, À., & Miozzo, M. (2010). Which words are activated during bilingual word production?. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 36(1), 96.
- Meuter, R. F., & Allport, A. (1999). Bilingual language switching in naming: Asymmetrical costs of language selection. *Journal of Memory and Language*, 40(1), 25-40.
- Giezen, M. R., & Emmorey, K. (2016). Language co-activation and lexical selection in bimodal bilinguals: Evidence from picture-word interference. *Bilingualism: Language and Cognition*, 19(2), 264-276.

Election day (no class on Nov 3)

Class 9 (Nov 10): How bilingualism changes the mind

Readings:

- Bialystok (2024). Bilingualism modifies cognition through adaptation, not transfer. *Trends in Cognitive Sciences*, 28, 987-997.
- Costa, A., Hernández, M., & Sebastián-Gallés, N. (2008). Bilingualism aids conflict resolution: Evidence from the ANT task. *Cognition*, 106(1), 59-86.
- Scaltritti, M., Peressotti, F., & Miozzo, M. (2017). Bilingual advantage and language switch: What's the linkage?. *Bilingualism: Language and Cognition*, 20(1), 80-97.

Class 10 (Nov 17): How bilingualism changes the brain

Readings:

- Mechelli, A., Crinion, J. T., Noppeney, U., O'doherty, J., Ashburner, J., Frackowiak, R. S., & Price, C. J. (2004). Structural plasticity in the bilingual brain. *Nature*, 431(7010), 757-757.
- Abutalebi, J., & Green, D. W. (2016). Neuroimaging of language control in bilinguals: neural adaptation and reserve. *Bilingualism: Language and cognition*, 19(4), 689-698.

For an introduction to MRI, watch the Youtube video *Basics of MRI* by Jamie Ward (<https://www.youtube.com/watch?v=-C84RFgyzuE>)

Class 11 (Nov 24): Effects of bilingualism on the aging brain

Readings:

- Bialystok, E., Craik, F. I., & Freedman, M. (2007). Bilingualism as a protection against the onset of symptoms of dementia. *Neuropsychologia*, 45(2), 459-464.
- Perani, D., Farsad, M., Ballarini, T., Lubian, F., Malpetti, M., Fracchetti, A., ... & Abutalebi, J. (2017). The impact of bilingualism on brain reserve and metabolic connectivity in Alzheimer's dementia. *Proceedings of the National Academy of Sciences*, 114(7), 1690-1695.
- Zahodne, L. B., Schofield, P. W., Farrell, M. T., Stern, Y., & Manly, J. J. (2014). Bilingualism does not alter cognitive decline or dementia risk among Spanish-speaking immigrants. *Neuropsychology*, 28(2), 238.

Class 12 (Dec 1): Beyond the lab: Science outreach activity

Does bilingualism slow dementia? What a neurologist should know

For this assignment, students summarize the main findings from studies that investigated the possible effects of bilingualism on dementia onset. This research summary aims to provide neurologists with a balanced review of often discordant findings on the link between bilingualism and dementia onset.

Class 13 (Dec 8): How languages affect decisions

Readings:

- Costa, A., Foucart, A., Hayakawa, S., Aparici, M., Apesteguia, J., Heafner, J., & Keysar, B. (2014). Your morals depend on language. *PloS one*, e94842.
- Keysar, B., Hayakawa, S. L., & An, S. G. (2012). The foreign-language effect: Thinking in a foreign tongue reduces decision biases. *Psychological Science*, 23, 661-668.
- Miozzo, M., Navarrete, E., Ongis, M., Mello, E., Girotto, V., & Peressotti, F. (2020). Foreign

language effect in decision-making: How foreign is it?. *Cognition*, 199, 104245.

Policies

a. Academic integrity

Students in this course are expected to work in accordance to the student honor code:

The Columbia College Student Council, on behalf of the whole student body, has resolved that maintaining academic integrity is the preserve of all members of our intellectual community – including and especially students. As a consequence, all Columbia College students will now make the following pledge: We, the undergraduate students of Columbia University, hereby pledge to value the integrity of our ideas and the ideas of others by honestly presenting our work, respecting authorship, and striving not simply for answers but for understanding in the pursuit of our common scholastic goals. In this way, we seek to build an academic community governed by our collective efforts, diligence, and Code of Honor.

All Columbia College students are committed to the following honor code:

I affirm that I will not plagiarize, use unauthorized materials, or give or receive illegitimate help on assignments, papers, or examinations. I will also uphold equity and honesty in the evaluation of my work and the work of others. I do so to sustain a community built around this Code of Honor.

b. Wellness

It is important for undergraduates to recognize and identify the different pressures, burdens, and stressors you may be facing, whether personal, emotional, physical, financial, mental, or academic. We as a community urge you to make yourself – your own health, sanity, and wellness – your priority throughout this term and your career here. Sleep, exercise, and eating well can all be a part of a healthy regimen to cope with stress. Resources exist to support you in several sectors of your life, and we encourage you to make use of them. Should you have any questions about navigating these resources, please visit these sites:

- <https://health.columbia.edu/>
- <https://health.columbia.edu/services/individual-counseling>

c. Accessibility Resources & Disability Services

Accommodations will be provided on-campus for in-person classes and through Zoom and other University-sponsored platforms for virtual events, classes and experiential learning (e.g., social work field placements). To learn more about available accommodations, students can contact Columbia Disability Services at any time by phone at [212-854-2388](tel:212-854-2388) or by email at disability@columbia.edu.