

## Neurolinguistics (腦神經語言學)

Instructor: Josephine Yi-ching Su

(I started working in the field of neurolinguistics more than 30 years ago as an MA student, working with aphasic patients and conducting research on the acoustic analysis of Mandarin/Taiwanese aphasic patients' tone and VOT production and later on their sentence comprehension impairments. Although there have been various ways of brain imaging techniques available nowadays to investigate how the brain works in a healthy person to process linguistic information, I believe the ultimate goal of studying neurolinguistics remain unchanged—to help those who have language impairments due to brain damage.)

### Course Description

The aim of this course is to provide students with a state-of-the-art survey of the neuroscience of language, a multidisciplinary field that has seen significant advances in the past few decades. Lectures and discussion will cover the central aspects of language processing in the brain such as auditory perception, lexical access and syntax/semantic processing from a range of studies of neurological and developmental language disorders, as well as functional neuroimaging.

### Textbooks

Selected readings from the two books below and other journals or books will be provided in class.

1. De Zubizaray, Greig I., & Schiller, Niels O. (2019) *The Oxford Handbook of Neurolinguistics*. Oxford University Press.
2. Ingram, John C. L. (2007) *Neurolinguistics: An Introduction to Spoken Language Processing and Its Disorders*. Cambridge University Press.

### Requirements

1. Class presentation and participation (20%)
2. Squib (30%): Choose 2-3 articles on a relevant topic and write a review
3. Lab assignment report (20%): Learn how to use PsychoPy (a free software) to run a lexical access experiment and write a report
4. Weekly reading reflective notes (20%)
5. Experiment participation (10%)

## Tentative Weekly Schedule

Week	Topic
1	Introduction
2	Foundational Issues Ingram (2007) ch. 1-4 In this lecture, we will cover fundamental aspects of linguistic competence, the basics of the neuroanatomy of language, and issues related to the modularity hypothesis vs. the connectionist models
3 – 4	Brain basics, methods, and history of neurolinguistics De Zubicaray & Schiller (2019) ch. 1-4 We will talk about a brief history of neurolinguistics, starting from the study of brain-damaged aphasic patients to more recent imaging techniques such as EEG, fMRI, MEG and the advantages as well as limitations of different methods
5 – 6	Speech perception and auditory processing Ingram (2007) ch. 5, 6, 8; De Zubicaray & Schiller (2019) ch. 20, 26 Topics to be covered include the segmentation problem and the variability problem of speech recognition, phonetic and phonological levels of processing in speech recognition, levels and types of auditory processing disorders etc.
7 – 8	Lexical and morphological processing Ingram (2007) ch. 9-11; De Zubicaray & Schiller (2019) ch. 21-23 Topics to be covered include morphological decomposition, word-sense disambiguation and context effect, category-specific semantic impairment and domain-specific semantic impairment, comprehension of metaphors and idioms etc.
9 – 10	Sentence processing Ingram (2007) ch. 12-14; De Zubicaray & Schiller (2019) ch. 27, 28, 30, 31 Topics to be covered include syntactic parsing and sentence comprehension, grammatical categories and neurocognitive mechanisms of agrammatism
11 – 12	Development and plasticity De Zubicaray & Schiller (2019) ch. 10-14 Topics to be covered include plasticity and bilingualism, aging, and deaf children
13 – 14	Grammar and cognition De Zubicaray & Schiller (2019) ch. 32-35 Topics to be covered include sentence processing and verbal working memory, subcortical contribution to language, neural mechanisms of music

	and language
15	Developmental disorders
16	Student presentation