Research Methods in Psycholinguistics

Irina A. Sekerina

March, 2016

# Class 1: Introduction

1. Research process: Basic concepts (hypothesis, variables, measurement, participants, s, design, data collection, statistical analysis)
2. Linguistics and psycholinguistics (competence vs. performance)
   * phonetics and phonology vs. speech production and speech perception
   * morphology vs. psychomorphology
   * lexicon vs. mental lexicon
   * syntax vs. sentence processing (=parsing)
   * semantics; discourse and pragmatics; interfaces
3. Types of methods in psycholinguistics
   * Offline: questionnaires; grammaticality and preference judgments task; act-out; sentence-picture verification
   * Online: priming; self-paced reading; eye-tracking; event-related brain potentials (ERP); fMRI; MEG
4. Topics and themes in psycholinguistics

Readings:

[1] Fernandez and Cairns (2011), Ch. 1 and Appendix

[2] *Research methods in cognition* (Chapter)

[3] Ambridge and Rowland (2013)

# Class 2: Offline and Online Methods

1. Pros and cons of different types of methods in psycholinguistics
2. Questionnaires:

* Demographc and language background questionnaires
* Grammaticality judgments
* Preference judgments

1. Act-out
2. Sentence-picture verification
3. Cross-modal priming
4. Self-paced reading
5. Eye-tracking

* Eye movements in reading
* Eye movements in spoken language comprehension (the Visual World Paradigm)

Readings:

[4] Grillo et al. (2015)

[5] Fernandez, Bradley, and Taylor (Unpublished Manuscript)

[6] Tanenhaus et al. (1995)

[7] Trueswell, Sekerina, Hill, and Logrip (1999)

[8] Sekerina, Hestvik, and Stromswold (2004)

[9] Nicol, Fodor, and Swinney (1994)

[10] Gordon, H rick, and Johnson (2001)

[11] Frazier and Rayner (1982)

[12] Trueswell, Sekerina, Hill, and Logrip (1999)

# Class 3: Software and Resources for Psycholinguistic Experiments

1. Chronometry programs:

* ePrime: Psychology Software Tools: http://www.pstnet.com/
* LINGER: A flexible platform for language processing experiments: <http://tedlab.mit.edu/~dr/Linger/>
* SuperLab by Cedrus: <http://www.superlab.com/experiments/>
* DMDX and visual DMDX (<https://experimentalfieldlinguistics.wordpress.com/links/software/dmdx/>)
* PARADIGM: <http://www.paradigmexperiments.com/>

1. Google tools (Google forms): <https://support.google.com/drive/answer/87809?hl=en>
2. Web-based interfaces:

* Amazon Mechanical Turk
* Survey Monkey: https://www.surveymonkey.com/

Repositories of free materials on the Internet

* + Images and pictures databases
* Object and action picture naming dataset at UCSD: http://crl.ucsd.edu/experiments/ipnp/
* Stimulus sets: http://www.cogsci.nl/stimulus-sets
  + Assessment materials

Readings:

[12] SuperLab SuperLab Manual

[13] Garaizar and Reips (2015)

[14] Gibson, Piantadosi, and Fedorenko (2011)

[15] Bates et al. (2003)

# Class 4: Experimental Psycholinguistics of Special Populations

1. Bilinguals, L2 learners, and heritage speakers
2. Children
3. Aphasic patients and older adults

Readings:

[16] Kroll and Rossi (2012)

[3] Ambridge and Rowland (2013)

[17] Caplan et al. (2007)

Class 5: Electrophysiology and language processing

**Instructor: Viktoria Havas, Language Acquisition and Language Processing Lab, NTNU**

1. Recording brain waves
   1. A brief introductions of electroencephalography
   2. What are we measuring?
   3. Frequency ranges and EEG
2. Event-related potentials (ERPs) in neurolinguistics
   1. What are ERPs?
      1. Data processing
      2. Latency and scalp distribution
   2. Design and interpretation of ERP experiments
      1. Lexical and semantic manipulations
      2. Morpho-syntactic manipulations
   3. Language related components
      1. N100
      2. N400
      3. eLAN
      4. P600
      5. P300
   4. Advantages and disadvantages of the ERP technique
3. Electric stimulation mapping (ESM)
   1. What is electric stimulation mapping?
   2. Neuroanatomy of language briefly
   3. ESM in epilepsy surgery
   4. ESM in tumour surgery
   5. Advantages and disadvantages of ESM

**Readings**

***Event-Related Potentials***

Kutas, M., & Van Petten, C.K. 1988. Event-related brain potential studies of language. *Advances in psychophysiology*, *3*, 139-187.

Kutas, M., & Van Petten, C.K. 1994. Psycholinguistics electrified, in: Gernsbacher, M.A. (Ed.) Handbook of psycholinguistics. San Diego, Academic Press, pp. 83-143.

Luck, S. J. 2014. An introduction to the event-related potential technique. MIT press.

Steinhauer, K., Connolly, J.F., 2008. Event-related potentials in the study of language, in: Stemmer, B., Whitaker, H.A. (Eds.), Handbook of the Neuroscience of Language. Academic Press, pp. 91–104.

***Electric Stimulation Mapping***

Duffau, H. (Ed.), 2011. Brain Mapping. From Neural Basis of Cognition to Surgical Applications. Springer Wien/New York, Vienna.

Gordon, B., Ledoux, K. 2008 Direct Electrical Stimulation of Language Cortex, in: Stemmer, B., Whitaker, H.A. (Eds.), Handbook of the Neuroscience of Language. Academic Press, pp. 105-114.