האוניברסיטה העברית בירושלים
THE HEBREW UNIVERSITY OF JERUSALEM

The Hebrew University of Jerusalem

Syllabus

INTRODUCTION TO LANGUAGE PROCESSING - 34861

Last update 08-02-2021

HU Credits: *1*

Degree/Cycle: *2nd degree (Master)*

Responsible Department: *Education*

Academic year: *0*

Semester: *2nd Semester*

Teaching Languages: *Hebrew*

Campus: *Mt. Scopus*

Course/Module Coordinator: *Avital Deutsch*

Coordinator Email: *Avital.deutsch1@mail.huji.ac.il*

Coordinator Office Hours: *Wednesday 9:00-9:45*

Teaching Staff:

Prof Avital Deutsch

Course/Module description:

This course will introduce basic principles in the organization and operation of the linguistic mechanisms that mediate language perception and production. The course will also introduce linguistic terms and concepts which constitute a fundamental conceptual basis on which the language mechanism is theoretically conceived

Course/Module aims:

To construct a basis of concepts necessary for understanding more advanced courses in the division of learning disabilities that address specific areas of language processing.

Learning outcomes - On successful completion of this module, students should be able to:

see course aims

Attendance requirements(%):

100%

Teaching arrangement and method of instruction: Lecture

Course/Module Content:

Introduction to language processing
Course description
This course will introduce basic principles in the organization and operation of the linguistic mechanisms that mediate language perception and production. The course will also introduce linguistic terms and concepts which constitute a fundamental conceptual basis on which the language mechanism is theoretically conceived.
Course aims
To construct a basis of concepts necessary for understanding more advanced courses in the division of learning disabilities that address specific areas of language processing.
Syllabus
Introduction
-Characteristics of human languages
- Introducing some of the classical issues in psycholinguistics: whether language processing reflects the operation of a language-specific modular system or is based

on a general cognitive system which serves other cognitive domains as well; language and thought; innateness versus acquisition (natural language, universal grammar, LAD).
-The distinction between linguistics and psycholinguistics.
-Modern linguistics: structural linguistics (diachronic and synchronic research), generative-transformative grammar (competence and performance).

Phonetics and phonology
I. The linguistic domain:
-minimal pairs
-phoneme, phone, allophone
-Phonetic transcription (IPA):
-Acoustic description of sounds: the vocal track, noisemaker, voicing, sine waves, complex waves (fundamental frequency, harmonics), formants, spectrogram.
-Articulatory description of sounds: vowels (the vocal trapeze), consonants (point of articulation, manner of articulation).
-Phonetic and phonology: co-articulation.
-Syllable: definition, phonotactic rules, syllabic components (onset, rime &eq; nucleus+coda), stress, metrical structure.
II. The psycholinguitic domain: The gap between acoustic cues and auditory language perception. The motor theory of speech perception – discussing its claim in light of the current experimental evidence. The mental representation of a phoneme – discussing the nature of its representation and categorical perception. Motoric and visual components in auditory speech perception. Context effects on speech perception.
The syllable: speech motor programing.
-The acquisition of the phonological system of one’s native language – Maintenance /Loss Hypothesis (critical period) versus Functional Reorganization Hypothesis. Implicit learning of statistical probabilities as a way of acquiring phonotactic rules and distinguishing the borders of words.

<u>Required Reading:</u>
Few selected items from the following list. Most items are for additional reading and/or rehearsal of the discussions that take place during the lectures.

Additional Reading Material:

רשימה ביבליוגרפית

אורנן, ע. (תשל"ב). דקדוק יוצר מהו. לשוננו לעם, כ"ג(ד), 83-116.

אורנן, ע. .(1979) המשפט הפשוט, עמודים 6-12. הוצאת אקדמון, ירושלים.

בן-חיים, ז. (תשי"ג). לשון עתיקה במציאות חדשה, לשוננו לעם, 3-15. (משאב אלקטרוני)

בלומפילד, ל. הפונמה: פרק 5 מתורגם מתוך: .Bloomfield, L (1933). Language מתוך: ע. אורנן (עורך) תורת ההגה של העברית החדשה – מקראה, האוניברסיטה הפתוחה, 1986.

גרודזינסקי, י. (1993) פסיכולוגיה ושפה, הוצאת הקיבוץ המאוחד. פרקים א', ג'. (משאב אלקטרוני)

לאופר, א. (תשל"ז). תיאור פונטי של תנועות, לשוננו, מ"א, 117-143. (משאב אלקטרוני)

לאופר, א. (תשמ"ג). השימוש בספקטוגרף לביסוס התעתיק הפונטי, מחקרי לשון מוגשים לזאב בן-חיים, 309-320, מגנס, ירושלים.

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לאיונס, ג. הגיי הלשון. פרק 3 מתורגם מתוך: J Lyons. Introduction to theorethical linguistics (1968) ב: תורת ההגה של העברית החדשה – מקראה, האוניברסיטה הפתוחה.

שורצולד (רודינג) א. (2002). פרקים במורפולוגיה עברית, האוניברסיטה הפתוחה כרך א יחידות 1-2, עמודים 15-17. (משאב אלקטרוני)

Aslin, R. N., Jusczyk, P. W., & Pisoni, D. B. (1998). Speech and Auditory Processing During Infancy: Constraints on Precursors to Language. In D. Kuhn & R. Siegler (Eds.) Handbook of Child Psychology: Vol 2, Cognition, Perception & Language (5th ed., pp. 147-198). New-York: Wiley.

Aslin, R. N., Saffran, J. R., & Newport, E. L. (1998). Computation of conditional probability statistics by 8-month-old infants. Psychological Science, 9, 321-324.

Bernard, A. (2017). Novel phonotactic learning: Tracking syllable-position and co-occurrence constrains. Journal of Memory and Language, 96, 138-154.

Best, C. T., McRoberts, G. W. , & Sithole, N. N. (1988). The phonological basis of perceptual loss for non-native contrasts; Maintenance of discrimination among Zulu clocks by English speaking adults and infants. Journal of Experimental Psychology: Human,Perception and Performance, 144, 345-360.

Boroditsky, L. (2001). Does language shape thought? Mandarin and English speakers'conceptions of time. Cognitive Psychology, 43, 1-22.

Creel, S., Tanenhaus, M., and Aslin, R. (2006). Consequences of lexical stress on learning an artificial lexicon. Journal of Experimental Psychology; Learning, Memory, and Cognition, 32, 15-32.

Conway, C. M., and Christiansen, M H. (2005). Modality-constrained statistical learning of tactile, visual, and auditory sequences. Journal of Experimental Psychology: Learning, Memory, and Cognition, 31, 24-39.

Dell, G. S., Reed, K. D., Adams, D. R., & Meyer, A., S. (2000). Speech errors, phonotactic constraints, and implicit learning: A study of therole of experience in language production. Journal of Experimental Psychology: Learning, Memory, and Cognition, 26(6) 1355-1367.

Dilley, L. C., and McAuley, J. D. (2008). Distal prosodic context affects word segmentation and lexical processing. Journal of memory and Language, 59, 294-311.

Elman, J. L., McClelland, J. L. (1988). Cognitive penetration of the mechanisms of perception: compensation for co-articulation of lexically stored phonemes. Journal of Memory and Language, 27, 143-165.

Endress, A. D., Mehler, J. (2009). The surprising power of statistical learning: When fragment knowledge leads to false memories of unheard words. Journal of Memory and Language, 60, 351-367.

Evans, J. L., Saffran, J. R., & robe-Torres, K. (2009). Statistical learning in children with specific language impairment. Journal of Speech, language, and Hearing Research, 52, 321-335.

Finley, S. (2013). Generalization to unfamiliar talkers in artificial language learning. Psychonomic Bulletin & Review, 20, 780-789.

Fowler, C. A., Brown, J. M., Sabadini, L., & Whenig, J. (2003). Rapid access to speech gestures in perception: Evidence from choice and simple response time tasks. Journal of Memory & Language, 49, 396-413.

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Frost, R., Armstrong, B.C., Siegelman, N., & Christiansen, M. H. (2015). Domain generality vs. modality specificity: The paradox of statistical learning. Trends in Cognitive Sciences, 19, 117-125.

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Gebhart, A. L., Newport, E. L., & aslin, R. N. (2009). Statistical learning of adjacent and nonadjacent dependencies among nonlinguistic sounds. Psychonomic Bulletin & review, 16, 486-490.

Glickson, A., & Cohen, A. (2013). The role of cross-modal associations in statistical learning. Psychonomic Bulletin and Review, 20, 1161-1169.

Goldin-Meadow, S. (2015). Studying the mechanisms of language learning by varying the learning environment and the learner. Language, Cognition and Neuroscience, 30, 899-911.

Iani, F. and Bucciarelli, M. (2017). Mechanisms underlying the beneficial effect of speaker's gestures on the listener. Journal of Memory and Language, 96, 110-121.

Heffner, C. C., Dilley, L. C., McAuley, D., and Pitt, M. A. (2013). When cues combine: How distal and proximal acoustic cues are integrated in word segmentation. Language and Cognitive Processes, 28, 1275-1437.

Kazanina, N., Bowers, J., S., & Idsardi, W. (2018). Phonemes: Lexical access and beyond. Psychonomic Bulletin & Review, 2018, 28, 560-585.

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Kittredge, A., K., and Dell, G. (2016). Learning to speak by listening: Transfer of phonotactics from perception to production. Journal of Memory and Language, 89, 8-22.

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Liberman, A. & Mattingly, I. G.(1985). The motor theory of speech perception revised, Cognition, 21, 1-36.

Luthra, S., Guediche, S., Blumstein, S. E., & Myers, E. (2019). Neural substrates of subphone mic variation and lexical competition in spoken word recognition. Language, Cognition and Neuroscience, 34, 151-169.

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Marques, L. C., Lapenta, O. M., Costa, T., L., and Boggio, P., S. (2016). Multisensory integration processes underlying speech perception as revealed by the McGurk illusion. Language, Cognition and Neuroscience, 31, 1115-1129.

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McMurray, B., Clayards, M. A., Tanenhaus, M. K., & Aslin, R. N. (2008). Tracking the time course of phonetic cue integration during spoken word recognition. Psychonomic Bulletin & Review, 15, 1064-1071.

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Nazzi, T., Lakimova, G., Bertoncini, J., Fredonie, S., and Alcantara, C. (2006). Early segmentation of fluent speech by infants acquiring French: Emerging evidence for

crosslinguistic differences. Journal of Memory and Language, 54, 283-299.

Nazzi, T., Jusczyk, W., & Johnson, E. K. (2000). Language discrimination by English –learning 5 Month-Olds: Effects of Rtythm and Familiarity. Journal of Memory and Language, 43, 1-19.

Nishibayashi, L.-L., & Nazzi, T. (2016). Vowels, then consonants: Early bias swich in recognizing segmented word forms. Cognition, 155, 188-203.

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Rosenblum , L. D., Rachel M. Miller, R. M.,and Sanchez, K. (2007). Lip-Read Me Now, Hear Me Better Later: Cross-Modal Transfer of Talker-Familiarity Effects. Psychological Science, 18 (5), 392-396.

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Saffran, J. R., Aslin, R. N., & Newport, E. L. (1996). Statistical learning by 8-month-olds. Science, 274, 1926-1928.

Saffran, J. R., Newport, E. L., Aslin, R. N., Tunick, R. A., & Barrueco, S. (1997). Incidental language learning: listening (and learning) out of the corner of your ear. Psychological Science, 8, 101-105.

Saffran, J. R., & Thiessen, E. D. (2003). Pattern induction by infant language learners. Developmental Psychology, 39(3), 484-494. doi:10.1037/0012-1649.39.3.484

Salverda, A. P., Dahan, D., & McQueen, J. M. (2003). The role of prosodic boundaries in the resolution of lexical embedding in speech comprehension. Cognition, 90, 51–89.

Salvedra, A. P., Dahan, D., Tanenhaus, M. K., Crosswhite, K., Masarov, M., and McDonough, J. (2007). Effects of prosodically modulated sub-phonetic variation on lexical competition. Cognition, 105, 466-476.

Siegelman, N. & Frost, R. (2015). Statistical learning as an individual ability: Theoretical perspectives and empirical evidence. Journal of Memory and Language, 81, 105-120.

Simanova, I., Francken, J., C., de Lange, F. P., and Bekkering, H. (2016). Linguistic priors shape categorical perception. Language, Cognition, and Neuroscience, 31, 159-165.

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Sun, Y., & Peperkamp, S. (2016). The role of speech production in phonological decoding during visual word recognition: evidence from phonotactic repair. Language, Cognition and Neuroscience, 31, 391-403.

Thiessen, E. D., & Pavlik, P. I. (2016). Modeling the role of distributional information in children's use of phonemic contrasts. Journal of Memory and Language, 88, 117-132.

Tye-Murray, N., Spehar, B. P., Myerson, J., Hale, S. and Sommers, M. S. (2013). Reading your own lips: Common-coding theory and visual speech perception. Psychonomic Bulletin & Review, 20, 135-141.

Warker, J., A., and Dell, G. (2006). Speech errors reflect newly learned phonotactic constraints. Journal of Experimental Psychology: Learning, Memory, and Cognition, 32, 387-398.

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ספרי עזר בעברית:

אשר לאופר (2008) פרקים בפונטיקה וברישום פונטי. מאנס. ירושלים.(book-e)

האוניברסיטה הפתוחה:
מבוא לבלשנות: רפאל ניר, יחידות 4-5, 6-7, 8-9, 10-12.)יחידות 4-5 נכתבו על ידי אשר לאופר.
בחיפוש ממוחשב ניתן להגיע גם דרך "מבוא לבלשנות" וגם דרך רפאל ניר או דרך אשר לאופר).
תורת הגה של העברית החדשה: עוזי אורנן, יחידות 1-4. אשר לאופר, יחידות 5-7.

Course/Module evaluation:
End of year written/oral examination 0 %
Presentation 0 %
Participation in Tutorials 10 %

Project work 0 %
Assignments 90 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

Additional information:
Submitting dates of the two exercises will be advertised in the course site before the beginning of the course.