Syllabus: Quantitative models in phonology

Time: Wednesday 10-1 pm
Place: 2-320
Office Hours: Tu 2:30 – 4:30 & by appointment (office: 3-407)
E-mail/Phone: jongho@snu.ac.kr / 880-6169

Prerequisite
Some basic knowledge of Optimality Theory is necessary.

Description & Goals
The typical data patterns employed in traditional generative phonology are systematic with no variation. Even when exceptions or variant output forms are attested, they have often been ignored or much simplified in formal analysis. However, the variable application of phonological processes (and gradient grammaticality intuitions) have recently attracted much attention with the understanding that the exceptions and variants occur in a systematic way in many cases. Moreover, the application rate of such variable processes is often influenced by phonological factors similar to those which condition the occurrence of corresponding categorical processes. As the need to explain the variation in phonology increases, probabilistic versions of Optimality Theory (OT), including a Maximum entropy (maxent) grammar, and their related learning models have been developed.

In this course, in order to explore characteristic patterns of variable phonological processes, probabilistic grammatical theories and their learning models, we survey recent studies of the variation in phonology. In so doing, we will focus on the following topics:

- an overview of statistical methods and their relation to maxent
- an overview of probabilistic OT theories
- frequency matching in variation
- variation in Korean phonology
- phonotactics and phonotactic learning

The goals of this course include not only to address the issues involved in the above topics but also to learn how to explain variation in your own data using the software, shown below:

✓ OTSoft (http://www.linguistics.ucla.edu/people/hayes/otsoft/)
✓ Praat (http://www.fon.hum.uva.nl/praat/)
✓ Maxent Grammar Tool (http://www.linguistics.ucla.edu/people/hayes/MaxentGrammarTool/)
✓ UCLA phonotactic learner (http://www.linguistics.ucla.edu/people/hayes/Phonotactics/Index.htm)

(I’ll probably not discuss the following in class.)
✓ Harmonic Grammar in R (http://blogs.umass.edu/hgr/)
✓ OT-Help (http://people.umass.edu/othelp/)

In addition, I will sometimes use the free statistical package called R in class. It is good to install it on your computer:

✓ R (https://www.r-project.org/), RStudio (https://www.rstudio.com/)
This course is an extension of the second half of my phonology II class (fall 2014), and modelled in part on Zuraw (2012) and Hayes & Zuraw (2013).

**Readings**

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**Additional required readings**

If a paper discussed in class can be downloaded from the Web, I will just inform you of the Web address. Otherwise, its electronic copy will be stored in the etl class site or sent to you by email.

**Requirements**

- Homework assignments (20%)
- Lead discussion of one paper in the required reading list (10%)
- A final term paper and its presentation (50%)
- Readings and class participation (20%)

**Final term paper**

- Select topic and meet with me by Oct. 28.
- Submit a one-page outline of the paper by Nov. 18.
- Paper Presentation: Last week (Dec. 11)
- Paper Due: Dec. 14

If you have any questions on the required reading papers and the problem, you can talk to me. For short questions, you can call me; for longer discussions, you can either take my office hours or make an appointment with me. E-mail may be useful for both purposes. Surely, you can come by my office with questions.

**Tentative Class Schedule (★student presentation)**

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics</th>
<th>Readings</th>
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</thead>
<tbody>
<tr>
<td>1. 9/2</td>
<td>Introduction: basics of statistics</td>
<td>Johnson (2008, chs 1-3)</td>
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<tr>
<td>2. 9/9</td>
<td>Regression</td>
<td>Johnson (2008, chs 4-5)</td>
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<tr>
<td>4. 9/23</td>
<td>Maxent (2)</td>
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<tr>
<td>5. 9/30</td>
<td>Overview of variation</td>
<td>Coetzee &amp; Pater 2011</td>
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<td>6. 10/7</td>
<td>Partially-ordered constraint theory</td>
<td>Antila (1997b)</td>
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<tr>
<td>7. 10/14</td>
<td>Stochastic OT Noisy HG</td>
<td>Boersma &amp; Hayes (2001), Coetzee (2009a)</td>
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<tr>
<td>8. 10/21</td>
<td>Mid-term (no class)</td>
<td></td>
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</tbody>
</table>
Bibliography

Anttila, Arto (1997b) Deriving variation from grammar. CILT 146.
Hayes, Bruce & Kie Zuraw (2013) Ling 251A/B: Topics in Phonetics and Phonology—Variation in phonology. Class handouts, UCLA. (http://www.linguistics.ucla.edu/people/zuraw/251_2013/)


(http://www.linguistics.ucla.edu/people/zuraw/courses/SNU.html)