

Computing assignment: the Gradual Learning Algorithm

due Tuesday, 24 November 2015

Overview and goals

- Learn how to use OTSoft
- Compare your previous MaxEnt grammar to Stochastic OT, Noisy Harmonic Grammar, and pseudo-Partial Ordering OT

Step-by-step instructions

Download, install, and test the MaxEnt Grammar Tool

1. Follow the instructions at <http://www.linguistics.ucla.edu/people/hayes/otsoft/>. Sadly, the software works **only in Windows**. If you are a Mac person, you'll need to use one of the department computers (many already have OTSoft installed, but make sure it's the latest version).
2. Step through pages 6-8 of the manual, running the sample file that comes with OTSoft (TinyIllustrativeFile.txt).
3. Explore the program's features a bit more, using the sample file: ranking argumentation, Hasse diagram, factorial typology.

Run three learning simulations

Using the tableaux file you prepared for **Shona** last week...

4. Run the Gradual Learning Algorithm. This will learn a Stochastic OT grammar. Make a note of what settings you use. You can stick with the defaults, or try something different. But, in the GLA screen, do use the Options menu to turn on "Print file with history of ranking values". Afterwards, rename the results folder so that it doesn't get overwritten.
5. Run Noisy Harmonic Grammar (uses GLA). Again, note your settings (print history file again) and rename the results folder. This option sometimes makes the program crash afterwards. Just restart the program.
6. Run the Gradual Learning Algorithm, but set both initial and final plasticity to 20 (and print history file). This will result in a pseudo-Partial Ordering OT grammar.

What to turn in

- A comparison of how well each of the three grammars above, plus your maximal-sigmas MaxEnt grammar from last time, fit the data. This could be four scatterplots (one comparing each grammar to the input probabilities), or some other approach. Your choice.

- Some discussion of any places where the grammars generate really different probabilities.
- For one of your three grammars here (say which one, of course), plots of how the ranking values changed over time during learning. Use the History file that was generated in the results folder. Since you have a lot of constraints, to make interpretable plots you'll probably need to do groups of 10 or so constraints at a time. You may have too many constraints to do all of them, but you could group together some related or competing constraints for illustration.
- Since there are going to be so many output files generated, and you've all been doing a great job of writing your reports so that I don't need to look at your files, we'll skip the CCLE upload this time.