Doing science to language

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Links:

This handout (in pdf, so the links are clickable):	incl.pl/shad
Me (Daniel Currie Hall):	incl.pl/dch
Linguistics at Saint Mary's University:	smu.ca/linguistics
Praat (software for analyzing and editing sound):	praat.org
Interactive sagittal section (consonants):	incl.pl/sammy
International Phonetic Alphabet (with sound):	www.internationalphoneticassociation.org/IPAcharts/inter_chart_2018/IPA_2018.html

Getting started with Praat

Praat is a computer application for recording, analyzing, and manipulating speech sounds. It was created by Paul Boersma and David Weenink, and can be downloaded from praat.org.

Recording a sound

- Under the **New** menu, select **Record mono Sound**… to bring up the **SoundRecorder** window.
- Make sure the appropriate input source is selected. (You may need to set the input device in the operating system, too.)
- Click **Record** — speak into the microphone — click **Stop**. If the microphone is picking up sound, then you should see a green bar under **Meter** when you are recording.
- You can listen to what you've just recorded by clicking **Play**. If you're happy with what you've got, you can give the sound a name in the text box labelled **Name:** and click the **Save to list** button; this will add the recorded sound to the list of objects in the **Praat Objects** window. Otherwise, clicking **Record** again will replace the sound you've just recorded with a new one.
- When you're done recording, you can **Close** the **SoundRecorder** window.

Viewing and editing a sound

- Sounds that you have 'saved to list' from the **SoundRecorder** window will appear in the **Praat Objects** window.
- If you want to save a recording for future use, you can write it to an audio file (in a format such as WAV or AIFF) using the **Save** menu. Saved files can be opened using **Read from file**… under the **Open** menu. (If the sound file you're trying to open is very long, you may need to use **Open long sound file**… instead.)

- If you click the **View & Edit** button, Praat will display a window containing a *waveform* and a *spectrogram* for the selected sound. (These are two ways of visualizing the sound.)
- You can click and drag to select part of the sound, and then zoom in on the selected portion by clicking the **sel** button at the bottom of the window or by choosing **Zoom to selection** under the **View** menu. (To zoom back out to the full sound, click **all** or choose **Show all** under **View**.)
- Praat can graph the *pitch* and *intensity* (loudness) of a sound in the window that opens when you **View & Edit** a sound. (Some of them may be turned on by default.) It can also trace the *formants* in a sound; this is a way of analyzing the *timbre,* or 'tone colour', of the sound. (For example, if you say the vowels in the words *heat* and *hoot* at exactly the same pitch and loudness, what's different between them is their timbre. Or, in music, timbre is the difference between the same note played at the same loudness on a flute *vs.* a violin.)
- You can **Cut** or **Copy** and **Paste** selected parts of a sound using the **Edit** menu (or the usual keyboard shortcuts on your operating system).
- You can **Reverse** the selected part of a sound by pressing **⌘R** (in MacOS; I assume ctrl-R does the same thing in Windows, but haven't tested this).

Some things to try

- We can turn 'buy the spread' into 'spy the bread' (or vice versa) by moving the [s].
- The difference between [t] and [d] is similar to the difference between [p] and [b]. Can you turn 'How steep is the ditch' into 'How deep is the stitch'?
- What do you think the word 'scrape' will sound like if you cut out the [s]?
- Can you say things that will sound like something else when you play them backwards? For example, try recording the phrase 'skid enough' and reversing it.
- Are there phonetic palindromes? That is, are there words or phrases or sentences that will sound (approximately) the same forwards and backwards? Here are some possibilities:
  - *loyal*
  - *new moon*
  - *funny enough*
  - *Who's a kazoo?*
  - *High earner, yeah?*
  - *What's never been's never been so.*
  - *We would lie when we say, 'Yes, you know we all love you.'*

You may have noticed that English spelling isn't very consistent about how it represents sounds. For example, the 'gh' at the end of 'enou**gh**' represents the same sound as the '**ph**' in '**ph**onetics' or the 'f' or 'ff' in '**f**lu**ff**'. The International Phonetic Alphabet (IPA) is a more systematic way of representing speech sounds; for example, it consistently uses the symbol [f] for the sound in 'enou**gh**', '**ph**onetics', and '**f**lu**ff**'. Thinking in terms of **sounds, not spellings** is key to understanding how all these examples work.