

## Praat handout #3    The Sound window: waveforms, spectrograms

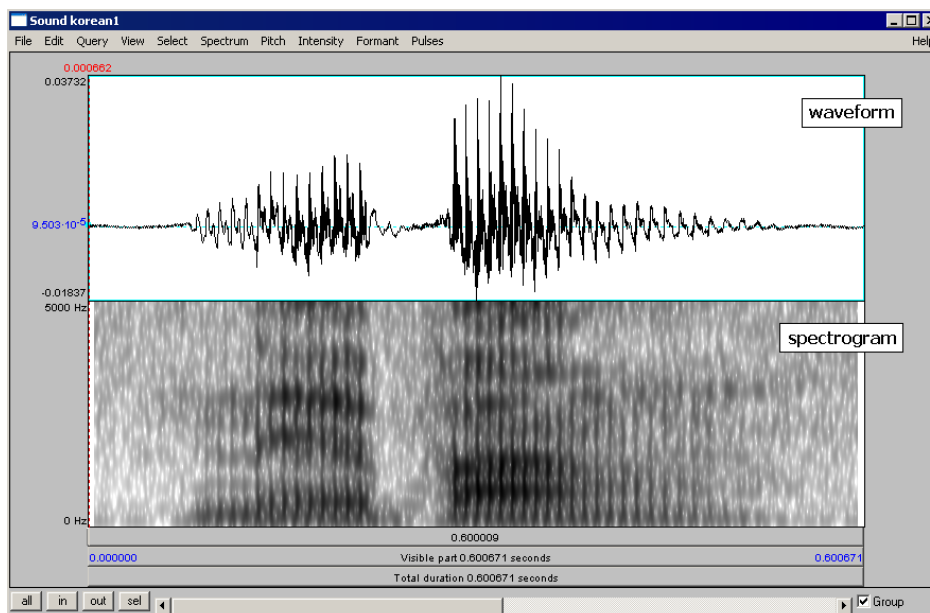
Praat allows us to study the acoustic characteristics of a sound file by viewing and measuring the sound file's waveform and spectrogram. This handout shows you how to display the waveform and spectrogram for a sound file, and how to turn the formant tracker, pitch tracker, and pulse tracker on and off.

The Praat software is frequently updated by its authors. The changes are usually small, but if you are using this handout along with a different version of Praat than the one listed below, you may find that some of the functions and features look or act slightly differently from the way they are described here.

*These instructions were updated for Praat version 4.3.20 on August 24, 2005.*

### 3.1 Opening a Sound window to view a waveform and spectrogram

- (1) Read a sound file into the Praat Objects window. (See Praat handout #2.)
- (2) Click on a file name in the List of Objects in the Objects window. The file name should now be highlighted (dark blue in Windows).
- (3) On the right side of the Objects window, click on the Edit button.
- (4) A new window (called `Sound XXX`, where `XXX` is the filename) will open, like this.



- The top display shows a *waveform*. A waveform tracks changes in air pressure over time as a sound is produced.
- The bottom display shows a *spectrogram*. A spectrogram provides information about the acoustic components of a sound. (We will learn about these components in more detail later in the semester.)

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## 3.2 Cursors, zooming, and making a selection

- If you click with the mouse in the waveform or spectrogram, a vertical line will appear (there may be a horizontal one too). This vertical line is a **cursor**.
- If you click, drag, and release the mouse, you will place two cursors and demarcate a **selection**. The selection will appear pink in Windows, or blue on a Mac.
- The small buttons at the bottom of the Sound window labeled *all*, *in*, *out*, *sel* let you zoom in and out on the waveform and spectrogram. The *all* button shows the whole sound file at once. The *sel* button makes a designated selection fill the window.

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## 3.3 Playing a sound file from the Sound window

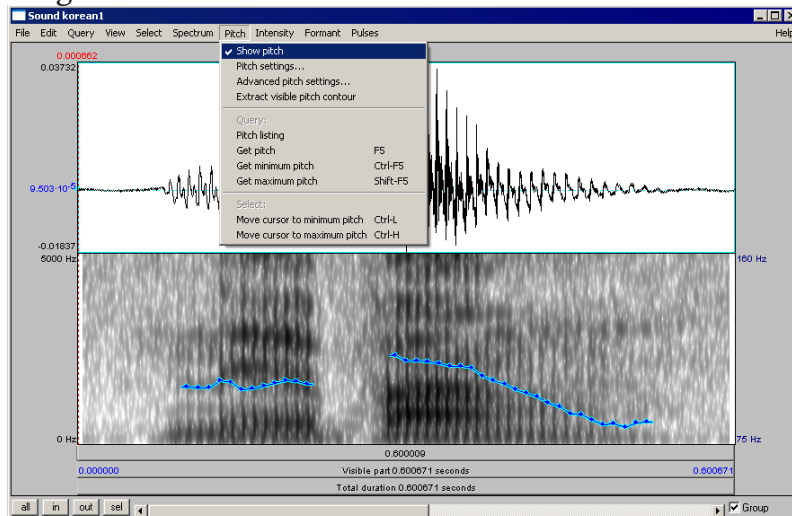
- There are two or three long, narrow buttons at the bottom of the Sound window. Click on these to find out what happens: you should start hearing things. (Press `ESC` to stop.)
- Place a cursor in the sound file, or select part of the sound file, and watch what happens to the buttons.

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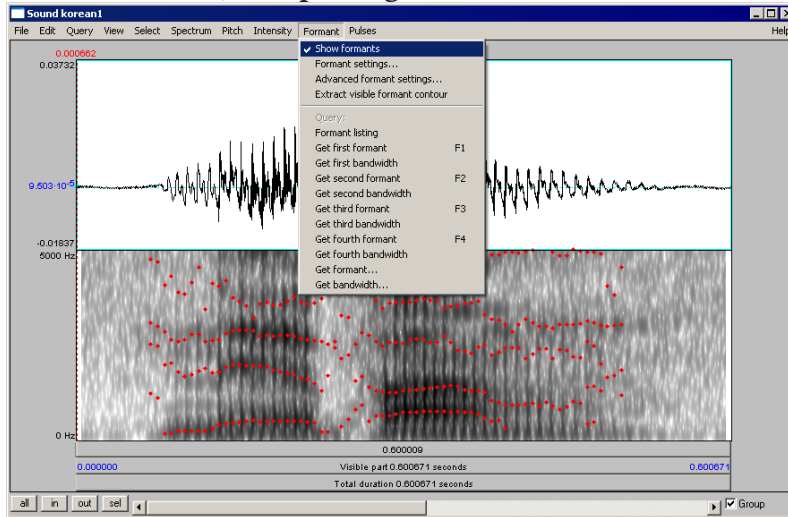
## 3.4 Other analysis tools in the Sound window

The menu bar across the top of the Sound window includes the items *Spectrum*, *Pitch*, *Formant*, and *Pulses*. During this course, you will learn more about what these analysis tools can tell us about the acoustic (and even articulatory) characteristics of speech sounds.

- The *Spectrum* menu has *Show spectrogram* as the first item. This is usually selected (T) when you install Praat. If you unselect this item, the spectrogram will disappear.
- The *Pitch* menu has *Show pitch* as the first item. If *Show pitch* is selected, a light-blue line will appear on the spectrogram. This is a pitch track, which estimates the fundamental frequency of the sound file over time. If you turn on the pitch tracker, the spectrogram looks like this:



- The Formant menu has Show formants as the first item. If Show formants is selected, four or five lines made of red dots will appear on the spectrogram. These are produced by the formant tracker, which estimates the value of the first four or five formants (vocal-tract resonance frequencies) of the sound file over time. If you turn on the formant tracker, the spectrogram looks like this:



- The Pulses menu has Show pulses as the first item. If Show pulses is selected, dark-blue vertical lines will appear on the waveform. These mark points in the sound file where Praat has detected a glottal pulse (one open-close cycle of the vocal folds).

If you turn on the pulse tracker, the waveform looks like this:

