Praat: Installation and basic functions

Praat [prɑːt] (Dutch for 'talk, tattle, boasting') is a freeware program for speech analysis. It is provided by Paul Boersma and David Weenink of the Institute of Phonetic Sciences, University of Amsterdam. This handout tells you how to download and install Praat on your own computer.

1. Downloading and installing Praat

(1) Go to the **Praat web site**: `http://www.praat.org`

(2) To **download** the version of Praat for your operating system, click on the appropriate link (i.e., "Windows") at the top left of the Praat main page and follow the directions.

(3) **Install** Praat on your computer — usually by clicking on the file that you have downloaded and telling the installer program where to put ("extract") the Praat program.

2. Basic Praat functions — opening and saving Sounds

2.1 Getting oriented: The main layout of the program

(4) When you open Praat, you see two windows: "Praat objects" and "Praat picture".

- (a) The **Picture window** can be ignored; feel free to close it.
- (b) The **Objects window** is like a main control panel. An **object** is anything that Praat has in its working memory. Examples include a sound that you have read into Praat from a file saved on your hard drive, or a "TextGrid" (a file containing labels for a Sound object).

(5) Here is what you see in the Objects window:

- (a) A **top menu bar** and **buttons** on the bottom. These features are for basic file and object management. They never change, regardless of the type of object you are working with.
- (b) A **list of objects** on the left side. This is empty when you start Praat (it looks like a large white box).
- (c) A **right-side menu bar**, which shows different options depending on what kind of object you highlight in the list of objects (see (b)). This menu bar will be empty if the list of objects is empty.

2.2 Reading a sound file from disk into the Objects window

(6) To work with a sound file in Praat, you first have to read it into the Praat Objects window. You do this as follows:

- (a) In the Objects window, click on `Read`, then `Read from file`. A dialogue window will open; find the desired sound files and click on them (one at a time, alas).
- (b) After you have told Praat to read in a sound file, it should appear in the Praat objects window as "`Sound XXX`" (where *XXX* is the filename).

2.3 Saving a Sound object from the Objects window to disk

(7) The sound files listed in the Objects window are temporary working copies. **Any changes you make to them in Praat will *not* affect the file saved on your computer.** If you have changed a Sound object and you want to make the changes permanent, you need to save the Sound object to disk, as follows:

(a) Highlight the Sound object in the Objects window.

(b) Click on `Write` in the top menu bar, and then choose `Write to...` for whatever audio file format you like. If you are on a Windows system, you may want to use WAV; if you are on a Macintosh, you may want to use AIFF or AIFC. But it doesn't really matter unless you plan to use these sound files with some other software on your computer. Just be sure to use an **audio** format (i.e., not "text"!).

(c) Once you choose a file format, you will get a dialogue box in which you can specify a file name (use a name that will remind you what the sound is) and where to save it.

3. Working with sound files — Waveform, spectrogram, pitch tracker

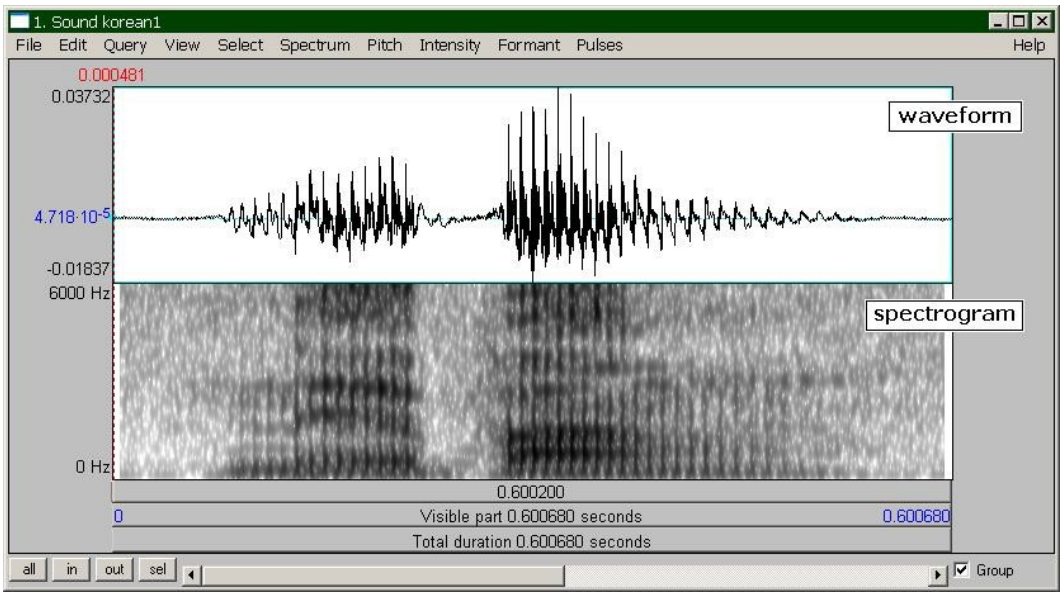
3.1 Opening a Sound window to view a waveform and spectrogram

(8) Read a sound file into the Praat Objects window. (See §2.)

(9) Click on a file name in the List of Objects in the Objects window. The file name should now be highlighted (blue in Windows).

(10) On the right side of the Objects window, click on the Edit button.

(11) A new window (called `Sound` XXX, where *XXX* is the filename) will open, like this.



(a) The top display shows a **waveform**. A waveform tracks changes in air pressure over time as a sound is produced.

(b) The bottom display shows a **spectrogram**. A spectrogram provides information about the acoustic components of a sound. For example, dark horizontal bars (formants) in mid-range frequencies indicate a vowel or a sonorant consonant.

3.2 Cursors, zooming, and making a selection

(12) 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**.

(13) 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.

(14) The small buttons at the bottom of the Sound window labeled `all, in, out, sel, bak` 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.

3.3 Playing a sound file from the Sound window

(15) There are two or three long, narrow buttons at the bottom of the Sound window that say "Visible part" and "Total duration," or just show numbers. Click on these to find out what happens: you should start hearing things. (Press `Esc` to stop.)

(16) Place a cursor in the sound file, or select part of the sound file, and watch these buttons.

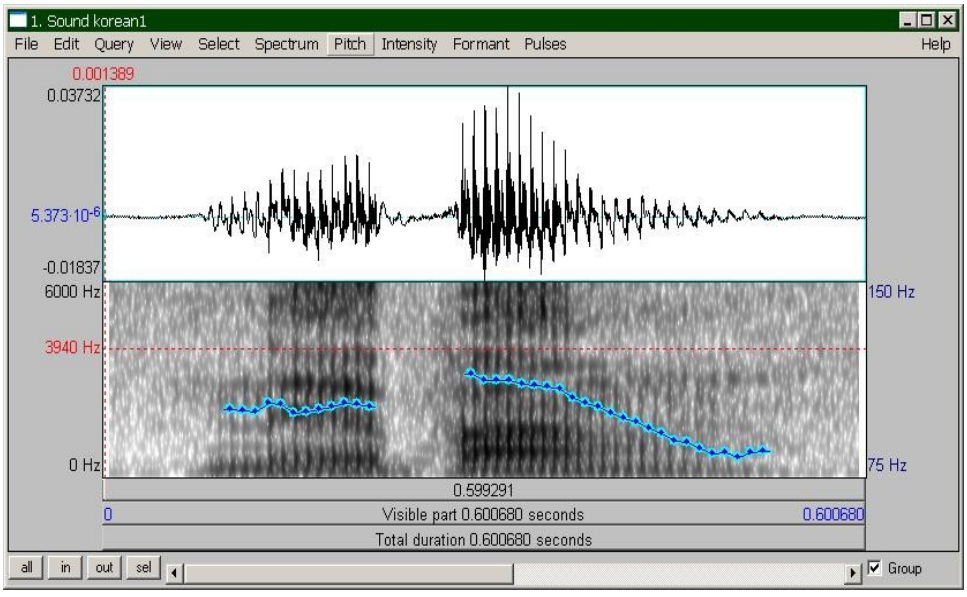
3.4 Pitch tracker and other analysis tools in the Sound window

(17) The menu bar across the top of the Sound window includes the items `Spectrum, Pitch, Formant,` and `Pulses`. For now, we will mostly be concerned with `Pitch`, but you may want to know how to turn other functions on (or off).

(18) The `Spectrum` menu has `Show spectrogram` as the first item. This is usually selected (✓) when you install Praat. If you unselect this item, the spectrogram will disappear.

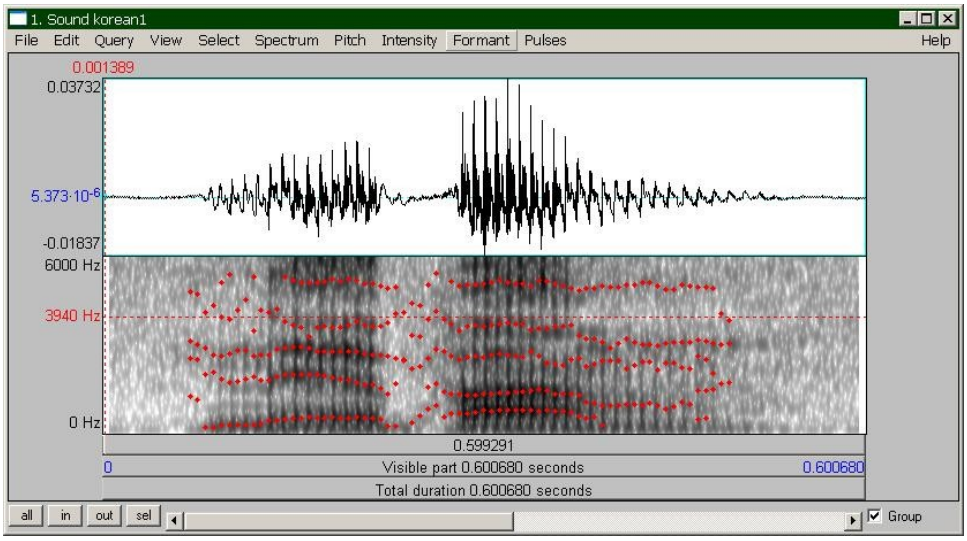
(19) The `Pitch` menu has `Show pitch` as the first item. If `Show pitch` is selected, a light-blue line with dots will appear on the spectrogram. This is a **pitch track**, which estimates the fundamental frequency of the sound file over time.

If you turn on the pitch tracker, the spectrogram looks like this:



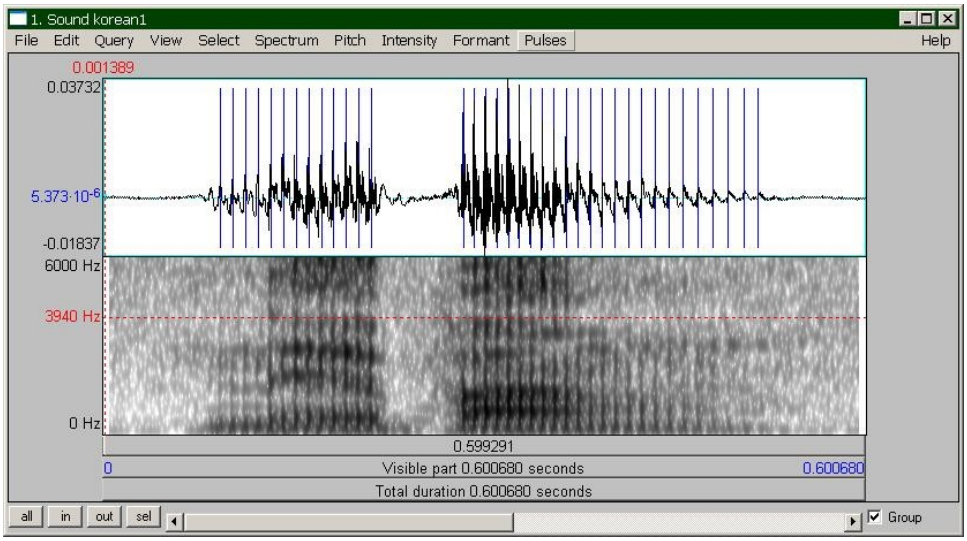
(20) The **`Formant`** menu has `Show formants` as the first item. If `Show formants` is selected, several lines made of red dots will appear on the spectrogram. These are produced by the formant tracker, which estimates the value of the first few **formants** (vocal-tract resonance frequencies) of the sound file over time.

If you turn on the formant tracker, the spectrogram looks like this:



(21) 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:



4. TextGrids: Labeling parts of your sound file

(22) A set of labels, called a "TextGrid," can be created for any Sound in your list of objects. You can use these labels to identify individual words or speech sounds in the sound file, so that it is easier to find what you want to measure or work with. You can also use them to keep a record of what you have measured, or to cut a large sound file up into smaller ones to be saved separately.

(23) How to open an existing TextGrid:

(a) To display a Sound with a TextGrid attached, you have to **select both** of these objects in the list of objects.

- Windows: Click on the first object you want to select. Then hold down the CTRL key while clicking on the second object you want to select.
- Macintosh: Same as above, except use the COMMAND key (the "cloverleaf" key).

(b) Once you have a Sound and its corresponding TextGrid selected together, click on `Edit` in the right-side menu bar of the Objects window. The sound file will open as usual, but there will be a **text tier** or tiers visible below the spectrogram.

4.1 Useful things to do with a TextGrid

(24) Clicking on an interval on a text tier is like a **shortcut to making a "selection"**. This makes it easy to do things like play, zoom in, etc.

(25) Praat also allows you to **combine multiple sound files** into one large file with a TextGrid.

(a) Read into the list of objects all the sound files you want to combine.

(b) Select all of the files at once.

(c) In the right-side menu bar, click `Combine sounds > Concatenate recoverably`.

- This creates two new objects in the list of objects: a Sound, called `chain`, and an associated TextGrid, also called `chain`.
- The TextGrid contains an interval tier where the labels on the intervals are the names of your original Sound objects.
- You may want to rename your new Sound and TextGrid to something more useful than `chain`. Also, remember to save them to disk if you want to keep them.

4.2 Creating your own TextGrid

(26) Select (highlight) a Sound in the list of objects in the Objects window. Then go to the right-side menu bar and click on `Annotate > To Text Grid`.

(27) You will get a dialogue box that asks you to give "tier names" and say which of the tiers are "point tiers." What all this means:

(a) You create one or more **tiers** for your TextGrid by naming them.

(b) It doesn't matter what tier names you use, and you can change them later (see below). Just put as many names in the box as the number of tiers you want to have for your sound file. (You can also add or delete tiers later as needed.)

(c) There are two kinds of tiers, **interval tiers** and **point tiers**. As the terms indicate, an interval tier lets you mark off an interval in a sound file (like a vowel, or a word) and label the whole interval. A point tier lets you mark a specific point and label that.

(d) Tiers are interval tiers by default, but you can make a tier be a point tier instead by indicating that in the dialogue box. (If you don't want any point tiers, keep the box labeled "Which of these tiers are point tiers?" blank.)

(28) Once you have named your tiers, you will see a new TextGrid object in the list of objects, with the same name as the Sound you made it from.

4.3 Modifying a TextGrid

(29) To demarcate and label an **interval** (word, vowel, …) on an interval tier:

(a) Click to place the cursor at the point *in the Sound part of the display* (i.e., on the waveform or the spectrogram) where you want the interval to begin.

(b) Where the cursor crosses the text tiers, there is a small circle at the top of each tier. If you click on the circle on a particular tier, it will place a **boundary** at that point (which becomes visible when you click elsewhere and move the red cursor). You can also place a boundary by pressing the ENTER key.

(c) Repeat step (b) to place a second boundary on the text tier.

(d) Now you have an **interval** between the two boundaries. Click inside the interval on the text tier. It will turn yellow. You can place a label in this interval by typing something into the large white box at the top of the window.

(30) To demarcate and label a **point** on a point tier, follow the same procedure, except that there is a label for each point instead one one label for a whole interval.

(31) **Editing** your intervals(/points) and labels:

(a) Move a boundary by clicking and dragging it.

(b) Change or remove a label by clicking on the interval *in the text tier* and making changes in the white box at the top of the window.

(c) Remove a boundary by clicking on `Boundary > Remove` on the menu bar at the top of the window. You can also remove the currently active boundary by typing ALT+BACKSPACE on a Windows machine.

(d) Add, remove, or rename tiers or perform other functions with `Tier` on the menu bar.

(32) Be sure to **save** your TextGrid object (your labels) to disk. Two ways to do this:

- From the TextGrid window, choose `File > Write TextGrid to text file`.
- From the Objects window, highlight the TextGrid and click on `Write > Write to text file`.

The next time you want to use your labels, read this file into the list of objects in the Objects window with `Read > Read from file`.