drawReactionData.praat

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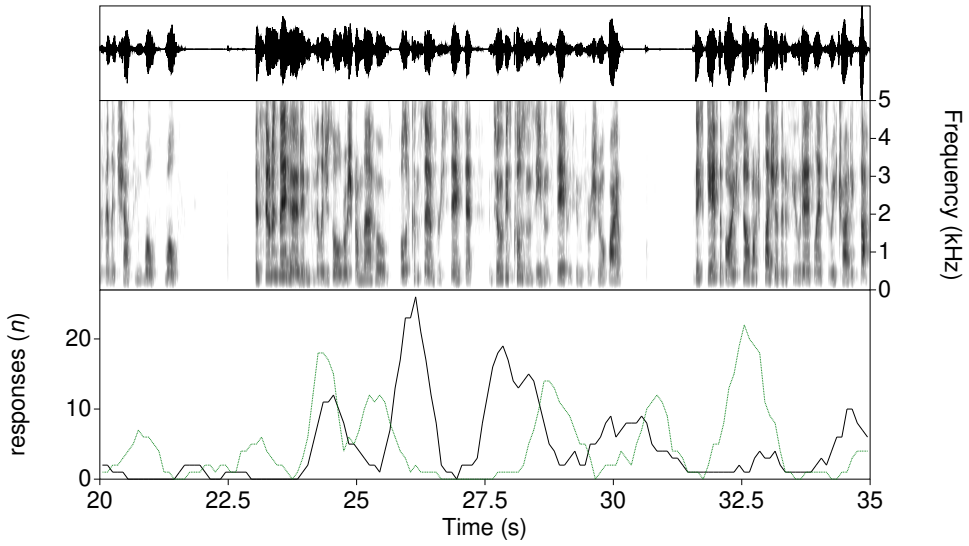
1 Introduction

This document describes how to use the Praat script `drawReactionData.praat`. The script is available from https://github.com/walkergareth/praat/blob/main/visreps/drawReactionData.praat. The script was written to prepare visual representations of the times of listeners' reactions to audio samples. It was originally developed to present data collected using the SLIC (Salient Language In Context) tool (https://slic.sheffield.ac.uk/) but it could be used to prepare visual representations of other data too: the input to the script is just a list of numbers (times). As well as a plot of the times of the reactions, the script can optionally draw a waveform and/or a spectrogram. Here is a sample image produced by the script showing the times of reactions from two groups of listeners:

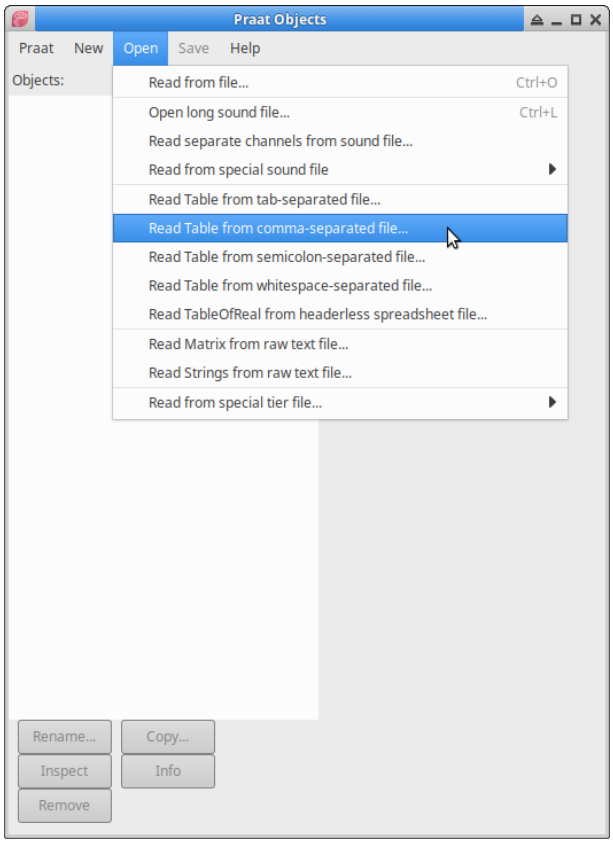


2 Getting ready

The script runs on a Table object in Praat. The Table must contain a column of times of the reactions. The Table may, but does not have to, contain other columns: the script allows you to specify which column contains the times of the reactions. Praat can create Table objects from various different file formats, including tab- and comma-separated files. Part of a comma-separated data file might look like this:

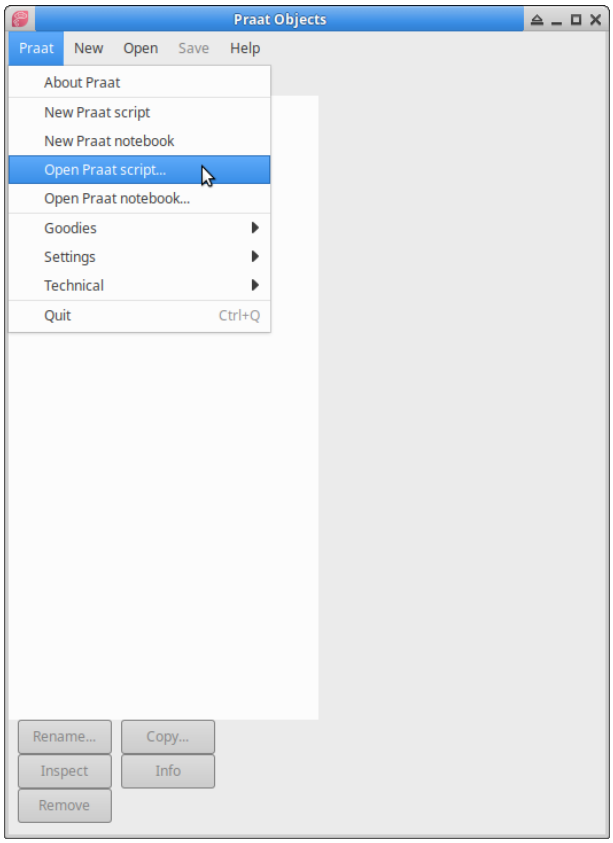
```
time,uid,comment,dk,accident,noClick,region,uidReg
10.599963,019,the word dark was pronounced strongly in their accent,,,,YH,019YH
34.49198,019,strong accent,,,,YH,019YH
17.269871,022,Pronunciation of fun,,,,SE,022SE
27.735627,022,safe-teh rather than safe-tee,,,,SE,022SE
30.698712,022,While pronounced with two syllables,,,,SE,022SE
40.121764,022,Aft-ah rather than aft-tur,,,,SE,022SE
9.494235,024,I think that was the pronunciation of 'poor',,,,SE,024SE
```

The data file can be read into Praat via the **Open** menu:

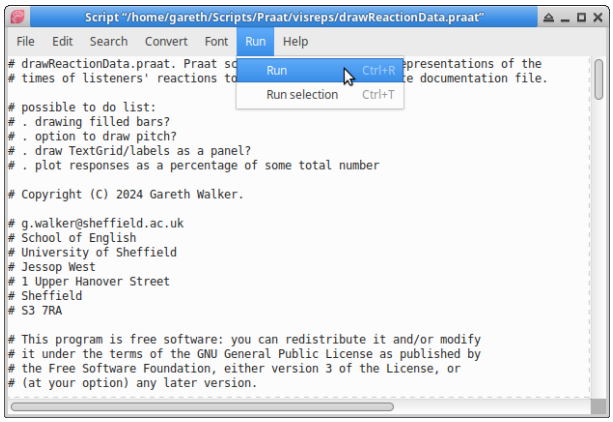


3 Running the script

Once downloaded, the script can be opened via the **Praat** menu and the **Open Praat script...** command:

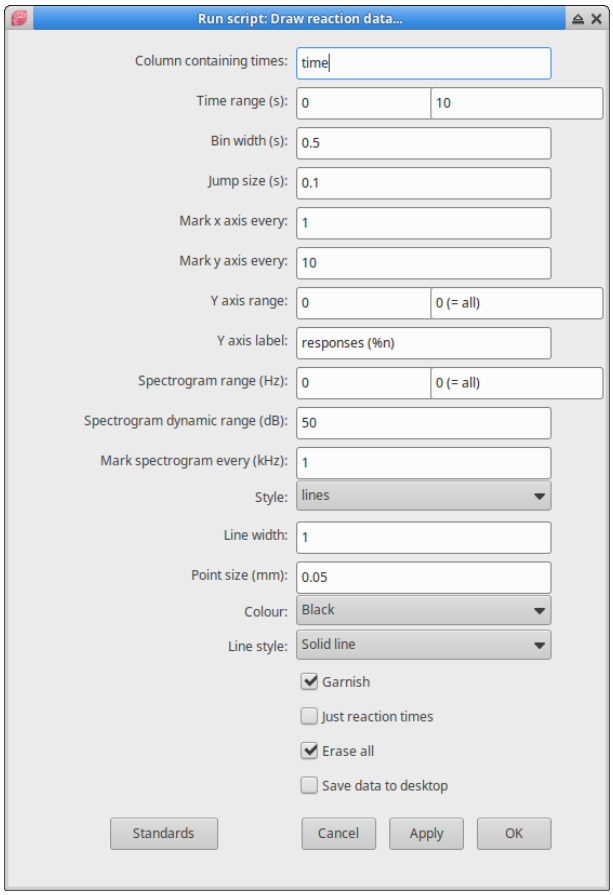


The script can be run from the ScriptEditor window, via the **Run** menu and the **Run** command:



(Alternatively you can create a button in a Praat menu to run the script: see the Praat manual.)

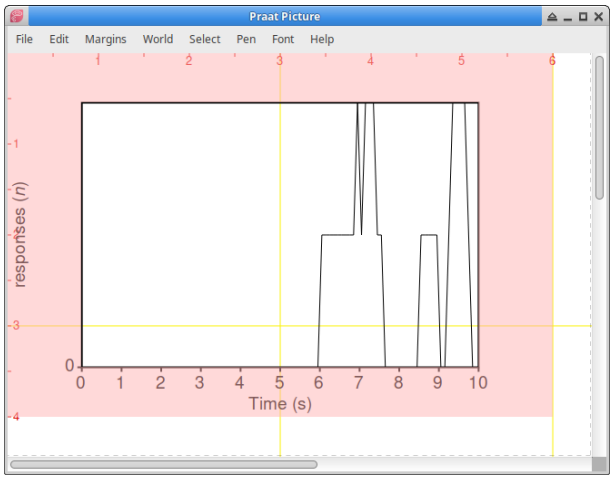
When you run the script a dialogue box appears.



This box lets you change various settings. *The pre-filled settings in the dialogue box probably won't be appropriate for your particular case and will need to be modified.* If you find that you are often changing the values in the dialogue box to the same value, you could change the default values by editing the script: see the "dialogue box" section of the script itself.

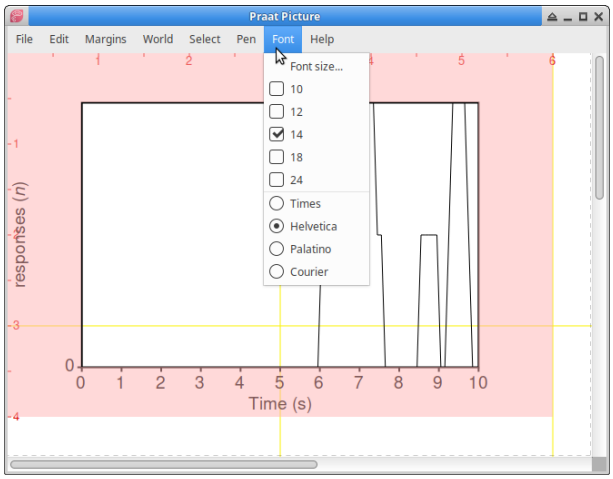
With your Table object selected in the List of Objects in the Objects window, click **Apply** or **OK** in the dialogue box (**OK** runs the script and closes the dialogue box; **Apply** runs the script and leaves the dialogue box open).

An image something like this will be drawn to the Picture window:



The line inside the plot shows the number of reactions as time passes. As you can see, the default options have not provided a very good visualisation in this case, but you will see how to adjust these later.

The image can be saved as a publication-ready graphic via the **File** menu in the Picture window. The size of the image is set by the pink box in the Picture window. This can be changed by clicking and dragging in the Picture window before running the script. The font size and style can be set via the **Font** menu in the Picture window:



4 Script options

This section describes the options available in the dialogue box.

Column containing times The name of the column in the Table object which contains the times of the reactions you want to plot.

Time range (s) The range of times you want to draw, in seconds. Default: draw reactions from 0 to 10 s.

Bin width (s) The size of the time window in which reactions must occur in order to be counted and plotted. Default: count and plot reactions occurring within a 0.5 s window.

Jump size (s) How far the time window set by *Bin width (s)* moves before the reactions are counted again. Default: move the window forward by 0.1 s.

If *Jump size (s)* is less than *Bin width (s)* (which is the default), the windows will overlap and reactions may be counted more than once; if *Jump size (s)* is the same as *Bin width (s)*, there will be no overlap between windows; if *Jump size (s)* is greater than *Bin width (s)*, some reactions may not be plotted.

Mark {x/y} axis every The frequency of marks on the {x/y}-axis.

Y axis range The range on the y-axis, the first number being the minimum and the second number being the maximum. Default: scale the axis so that it plots from 0 to the maximum number of responses.

Y axis label The label on the y axis.

Spectrogram range (Hz) The range on the y-axis of the spectrogram, the first number being the minimum and the second number being the maximum. Default: scale the axis so that it plots the whole frequency range of the spectrogram.

Spectrogram dynamic range (dB) The spectrogram dynamic range: see the Praat manual.

Mark spectrogram every (kHz) The frequency of marks on the y-axis of a spectrogram.

Style The style of the plot of reactions. Options: bars, filled bars, lines, points, lines and points, none (just draw the border). Default: lines.

Line width The width of the line used for the 'lines' and 'lines and points' Style option. Deafult: 1 mm.

Point size The size of the points used with the 'points' and 'lines and points' Style option. Default: 0.05 mm.

Colour The colour of the plot of reactions.

Line style The style of the plot of reactions. Options: solid line, dotted line, dashed line, dashed-dotted line.

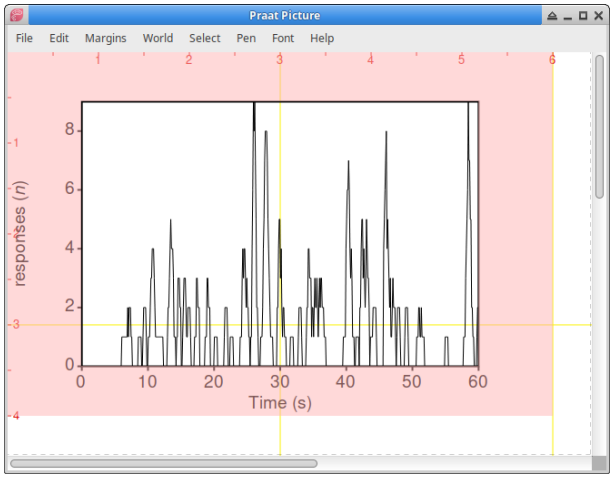
Garnish Draws the boxes, axis labels, axis titles, etc. Default: on.

Just reaction times Draws just the plot of reactions, but leaves space for the other elements. See the demonstration below for more detail. Default: on.

Erase all Clears the Picture window before drawing. Default: on.

Save data to desktop Saves a CSV file containing the counts of reactions (start of each bin, end of each bin, count of reactions) to the desktop. The script may need to be edited set an appropriate path to your desktop before running the script. Default: off.

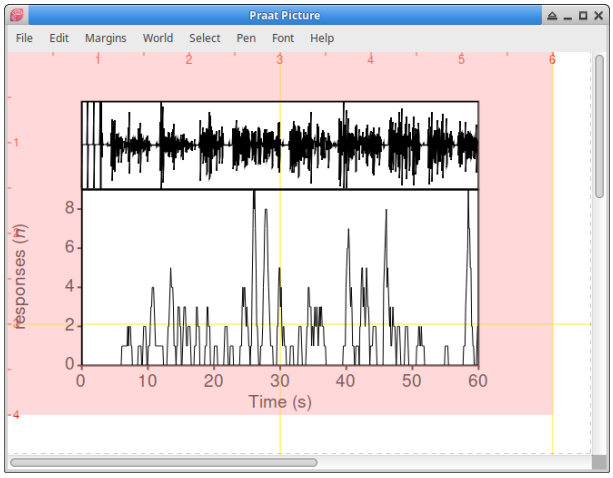
By changing the just the Time range, Mark x axis every, Mark y axis every, we can get this, which is already more usable:



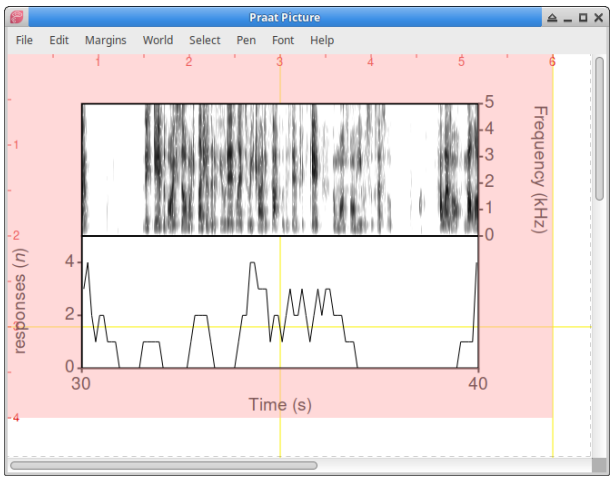
5 Going further

5.1 Drawing things alongside the plot of reactions

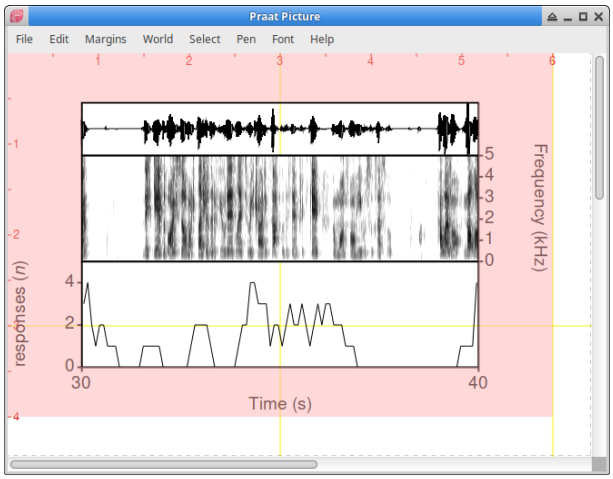
To draw a waveform with the plot of the times of the reactions, read a Sound file into Praat (check the Praat manual if you are unsure how to do this), select the Sound and Table objects in the Objects list (you may need to press the Control key as you select the objects), and run the script:



To draw a spectrogram with the plot of the times of the reactions, first create a Spectrogram object (one way is to select the Sound in the Objects list, then **Analyse spectrum** > **To Spectrogram...**). Then select the Spectrogram and the Table objects in the Objects list (you may need to press the Control key as you select the objects), and run the script (the time range in this plot has also been changed so you can better see the spectrogram):



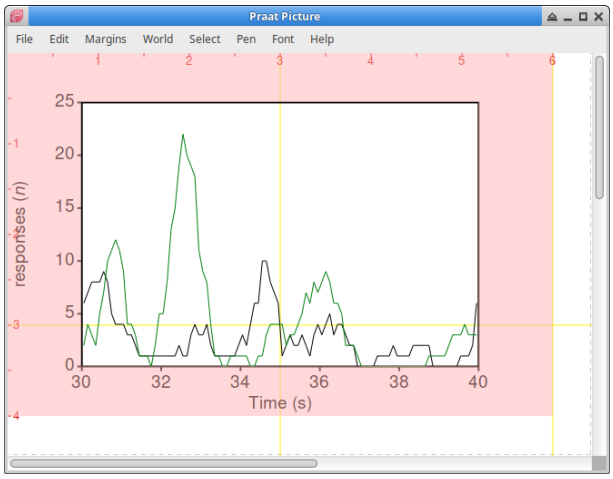
You can draw the sound, a spectrogram and the plot of the times of the reactions by selecting all three objects (you may need to press the Control key as you select the objects) and running the script:



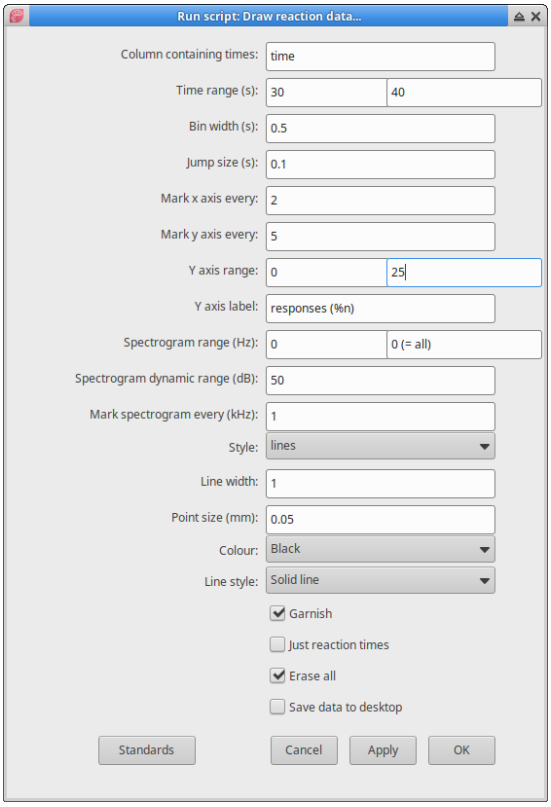
(A reminder: for demonstration purposes you are seeing screenshots in this document, but you should save your picture as a publication-ready graphic via the **File** menu in the Picture window.)

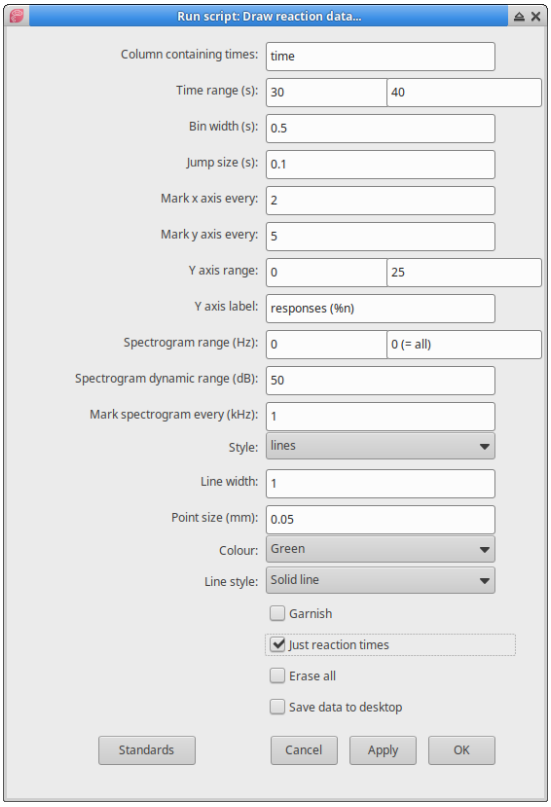
5.2 Plotting multiple samples

You can run the script multiple times to plot different samples on the same visualisation. The example below shows you two samples drawn on the same visualisation. The information for each sample was stored in a different Table object, selecting a different object each time the script was run.

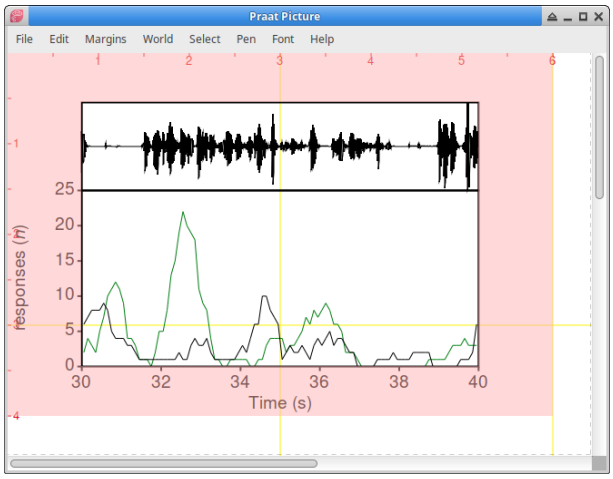


Some tips for drawing multiple samples: you will usually keep the options for the axes the same. You might change the colour and/or style of the plot for any subsequent plots: the description of script options above. If after the first time you run the script, you switch off the “Garnish” and “Erase all” options, and switch on the “Just reaction times” option, any subsequent plots of reaction times will be laid over the previous plot(s). The dialogue box below left is what was used to plot the first sample in the image above (shown in black); the dialogue box below right is what was used to plot the second sample in the image above (shown in green):





You can also include a waveform and/or spectrogram in these plots, in which case you need to be sure to have those objects selected each time you run the script so that the layout is correct:

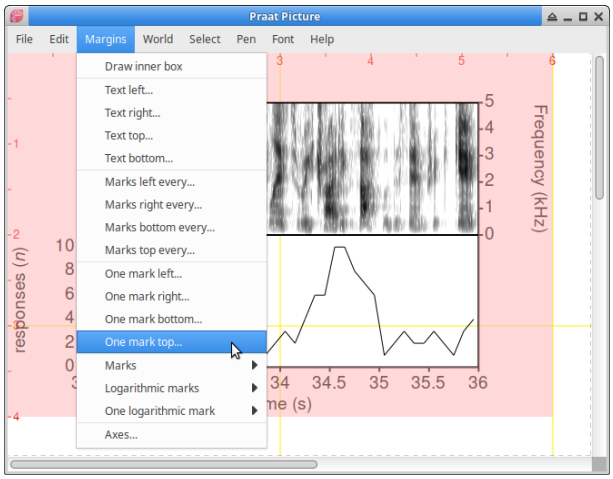


5.3 Adding labels

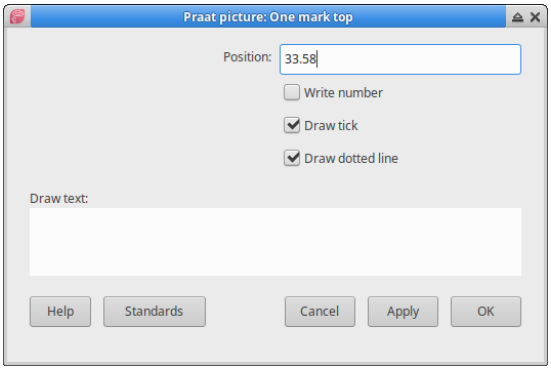
You may wish to add labels to your plots. Here are two ways you can do that; there are other ways.

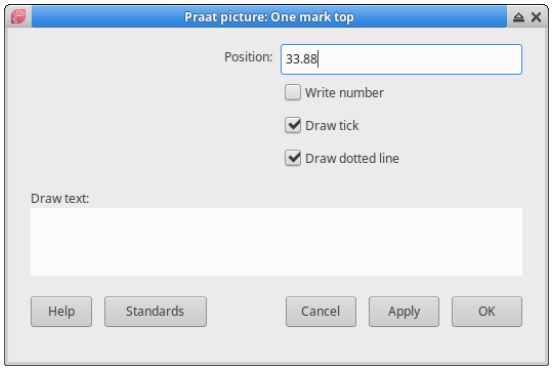
5.3.1 Using the "One mark top..." command

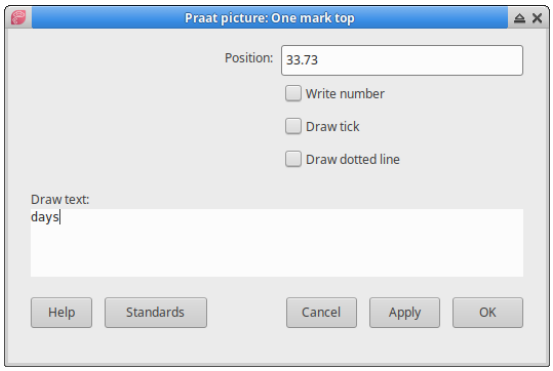
From the Praat Picture window, go to **Margins** and select e.g. **One mark top...**:



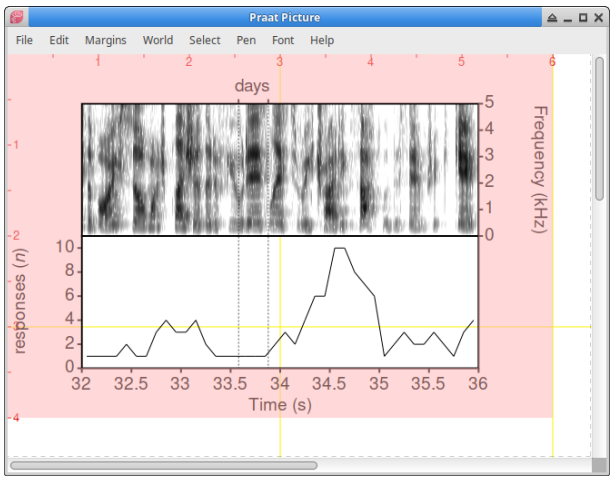
You can then run one or more commands to place ticks and labels along the top of your plot. For example, applying this sequence of commands:





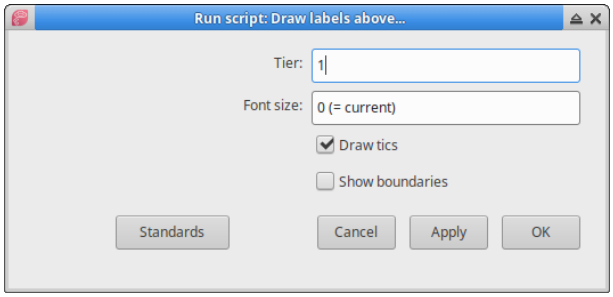


results in this output:

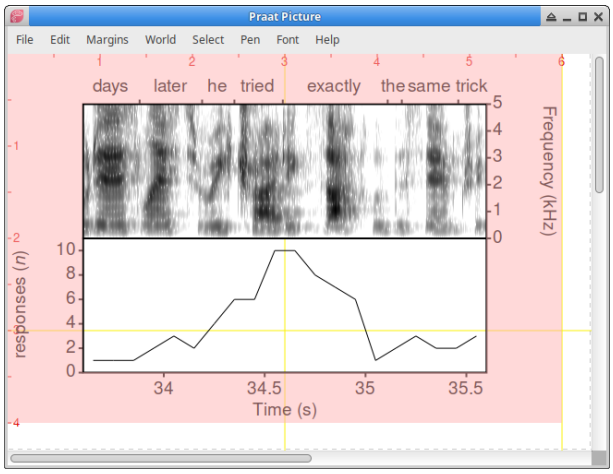


5.3.2 Using another script

The Praat script `drawLabelsAbove.praat`, available from https://github.com/walkergareth/praat/blob/main/visreps/drawLabelsAbove.praat, allows you to draw the contents of a TextGrid object along the top of your plot. This might be helpful if you have a lot of labels to add. Open the script in the same way as described above, then select the TextGrid containing the labels you want to draw, and run the script. Select your options in the dialogue box



and run the script.


Praat Picture
File Edit Margins World Select Pen Font Help
days later he tried exactly the same trick
Frequency (kHz)
responses (n)
Time (s)
34 34.5 35 35.5