

Intonation des Deutschen

2019-20

Athens

Caroline Féry

Sitzung 3

Praat

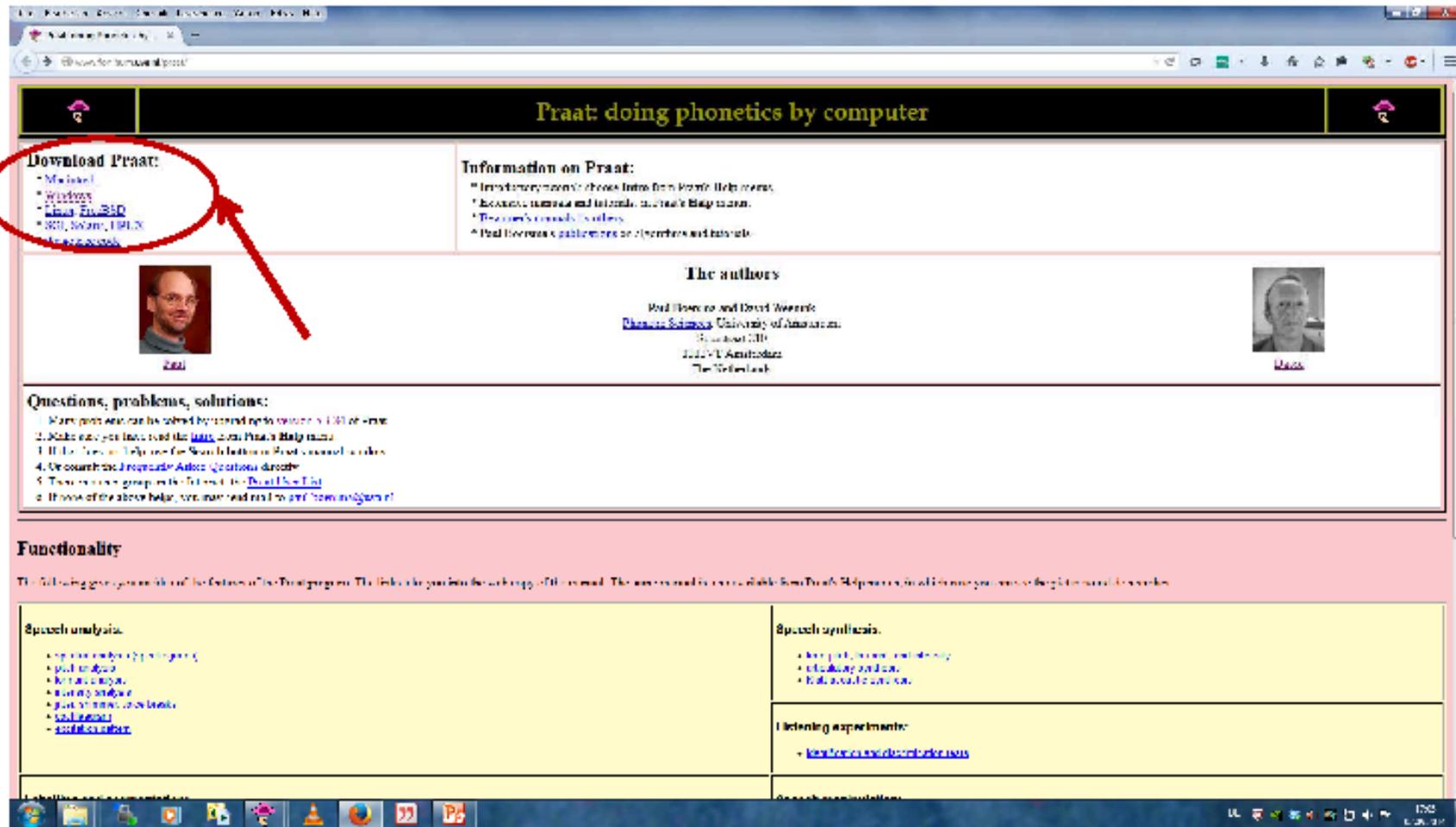
Introduction to Praat

- I. Praat basics (Installation, architecture, recording)
- II. Transcription
- III. Scripting – introduction
- IV. Vowels
- V. Consonants
- VI. Fundamental frequency
- VII. Praat picture
- VIII. Perception tests
- IX. Exercises

Praat (www.praat.org)

Boersma & Weenink 2014

Installation: Download / double-click

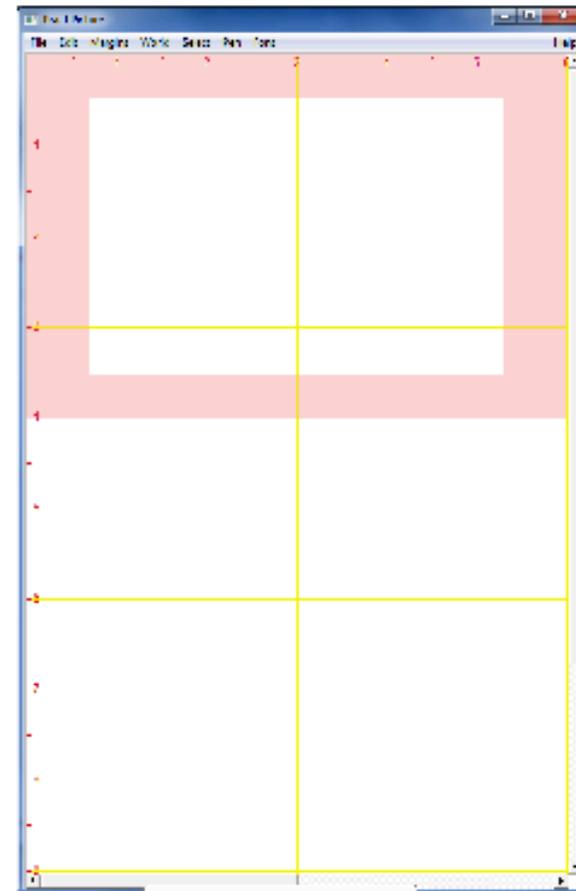
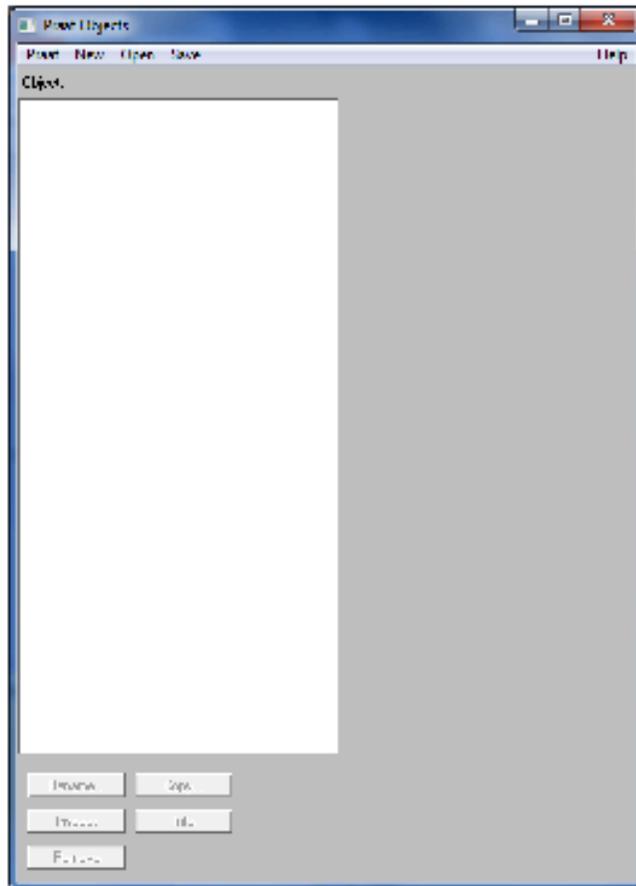


I. - Praat (www.praat.org)

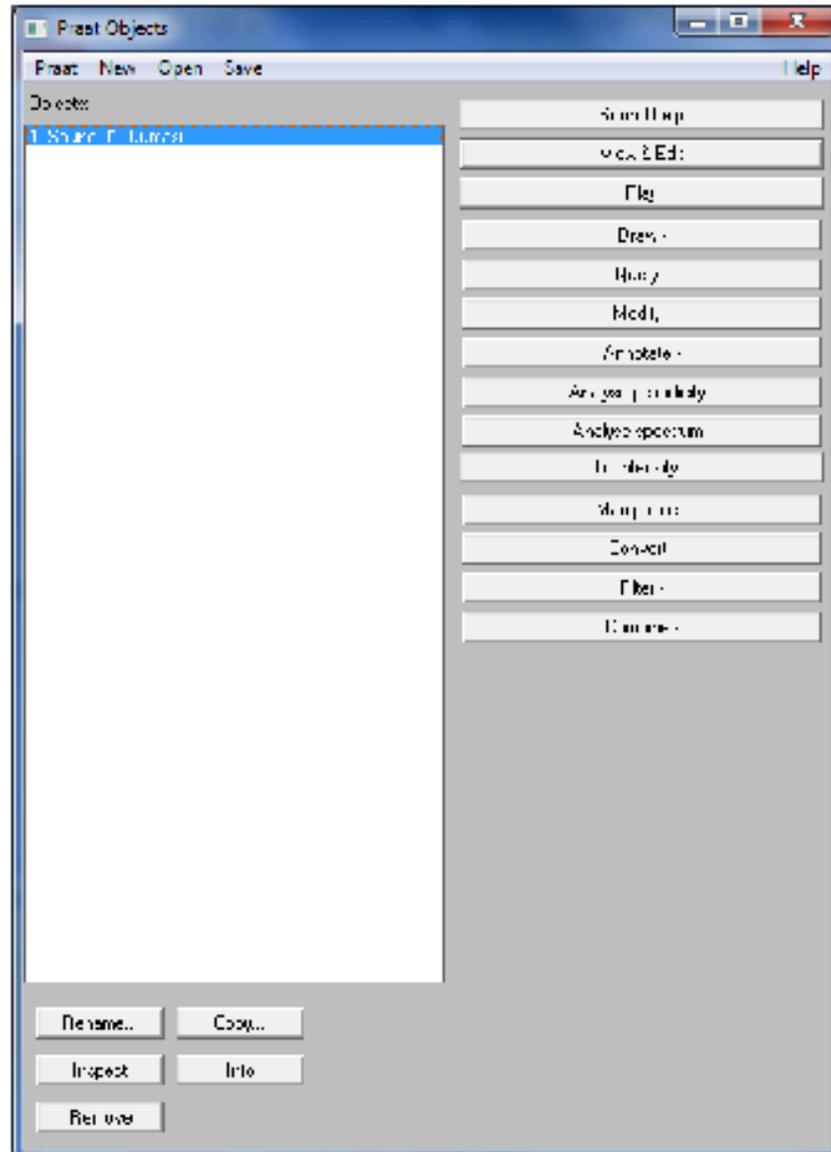
Start configuration: Two windows – Objects and Picture

- **Object window handles file input and output (today)**
- **Picture window provides functions to create publication-quality graphics**

(later)



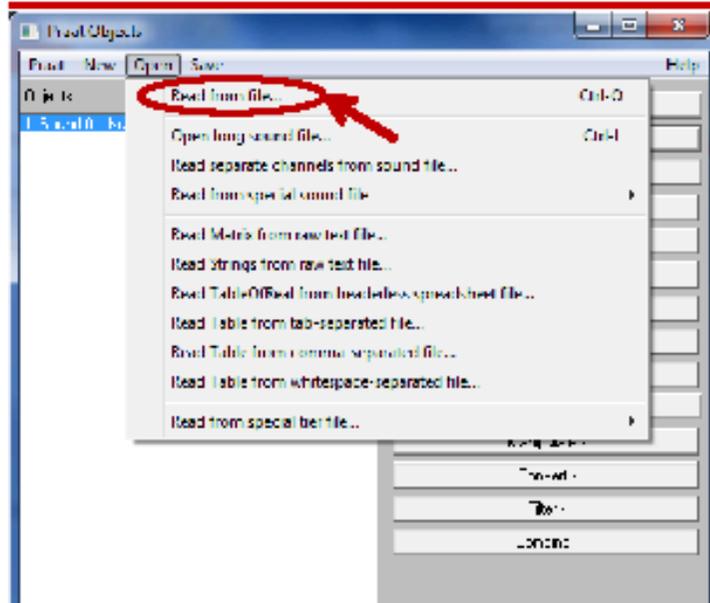
I. - Praat



- ◇ Open-source speech analysis program
 - Acoustic analysis
 - Speech synthesis
 - Sound manipulation
 - Creation of graphics
 - Annotation of sounds
 - (Semi-)automatic analysis across files

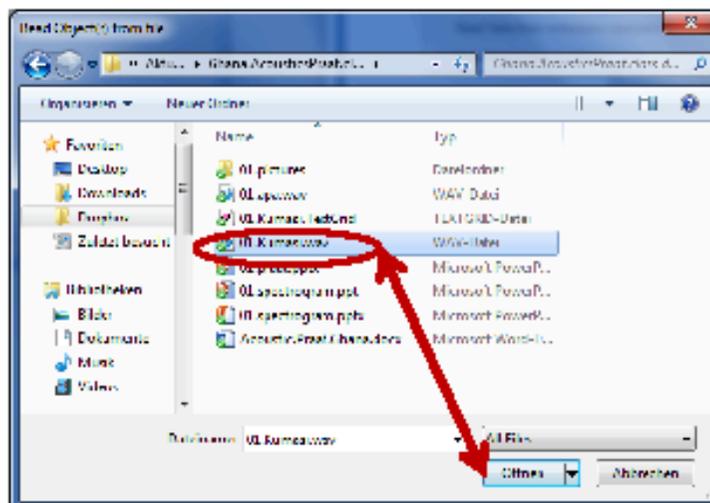
- ◇ Praat objects
 - File = object
 - to handle file input and output
 - data structures in memory
(=not saved! ⇒ **always save your edited / created objects !**)

I. – Praat: First steps



◇ Two types of menus – static vs. mutable

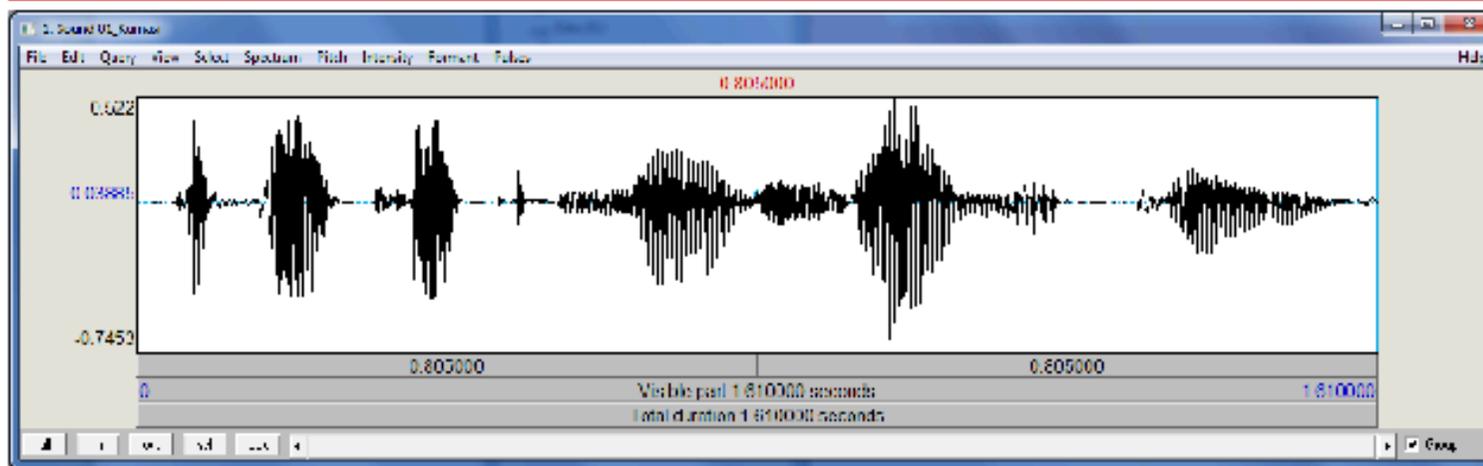
- Static menu (on top) – permanent and unchanged functions (Praat, New, Open, Save, Help)
- Mutable menu (to the right) – functions dependent on the type of object (e.g. Sound → Play)
 - each object has particular analysis, query and manipulation functions



◇ Open a file “Read from file...”

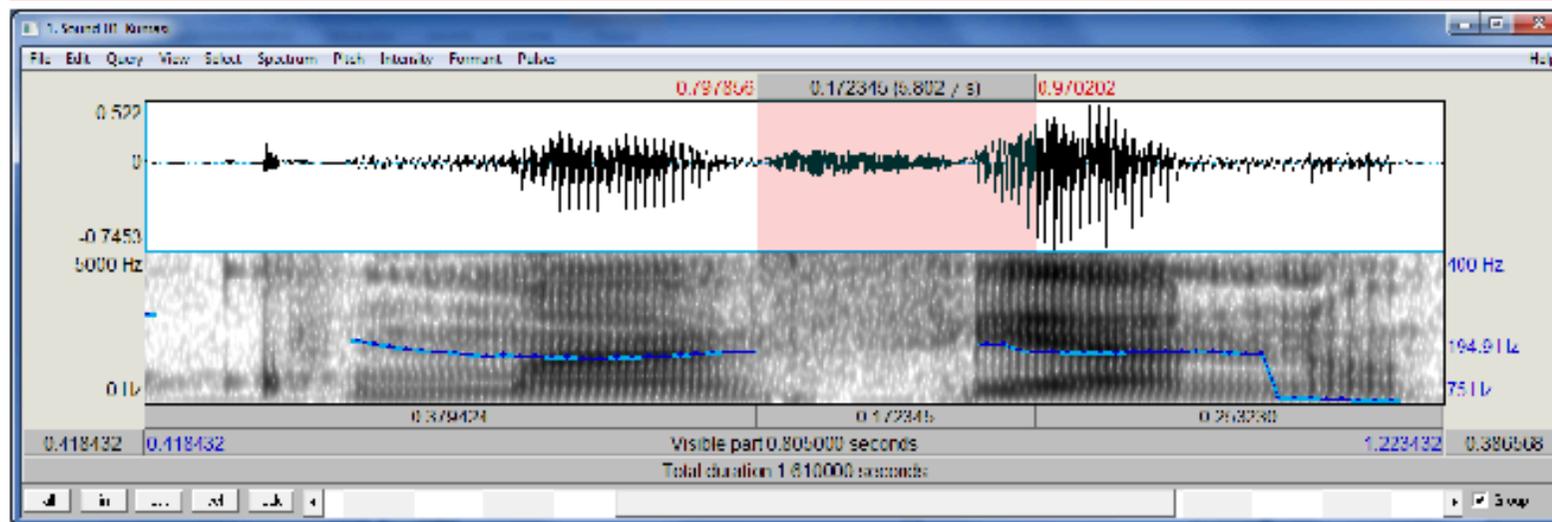
- e.g. a sound file “Kumasi.wav”
- Mutable menu shows all the options you have with a sound file
 - Click “Play”
 - Click “View & Edit”

I. - Praat: Sound window



- ◇ Window: Sound editor – the oscillogram
 - **Play:** top menu “View” / click on the bars below: parts or total sound
 - **Select part:** top menu “Select” / left mouse click & drawing
 - **Zoom:** top menu “View” / bottom left buttons
 - View spectral analysis → Menu: “Spectrum-Show spectrogram”
 - View fundamental frequency (pitch) → Menu: “Pitch-Show pitch”
 - View formants / intensity / pulses → Choose from top menu accordingly
 - Query menu: Get timing information of file selection
 - Edit menu: Cut, Copy, Paste sound(parts), Set selection to zero

I. - Praat: Sound window



- ◇ Effect of “zoom in” and “Show spectrogram / Show pitch (blue curve)”
 - Button-like rectangles above the oscillogram and below the analyses show
 - which part of the sound is selected (red part),
 - which visible part comes before and after selection,
 - and which invisible remaining parts of the whole file there are.
 - Spectral analysis scale is given at left: 0 - 5000 Hz
Change settings: Menu → “Spectrum-Spectrogram settings...”
 - Pitch analysis scale is given at the right side: 75 - 400 Hz
Change settings: Menu → “Pitch-Pitch settings...”

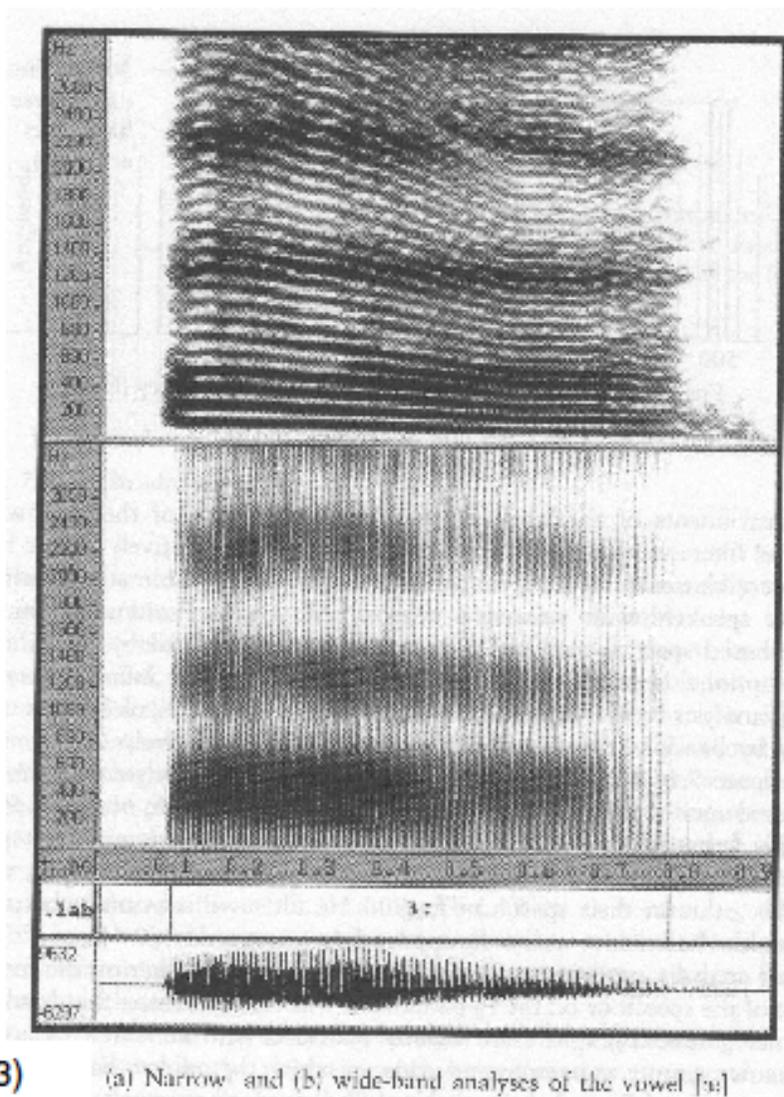
Narrowband and broadband spectrogram

narrowband

harmonics
(including F0)

broadband

formants



aus: Clark & Yallop (2007:253)

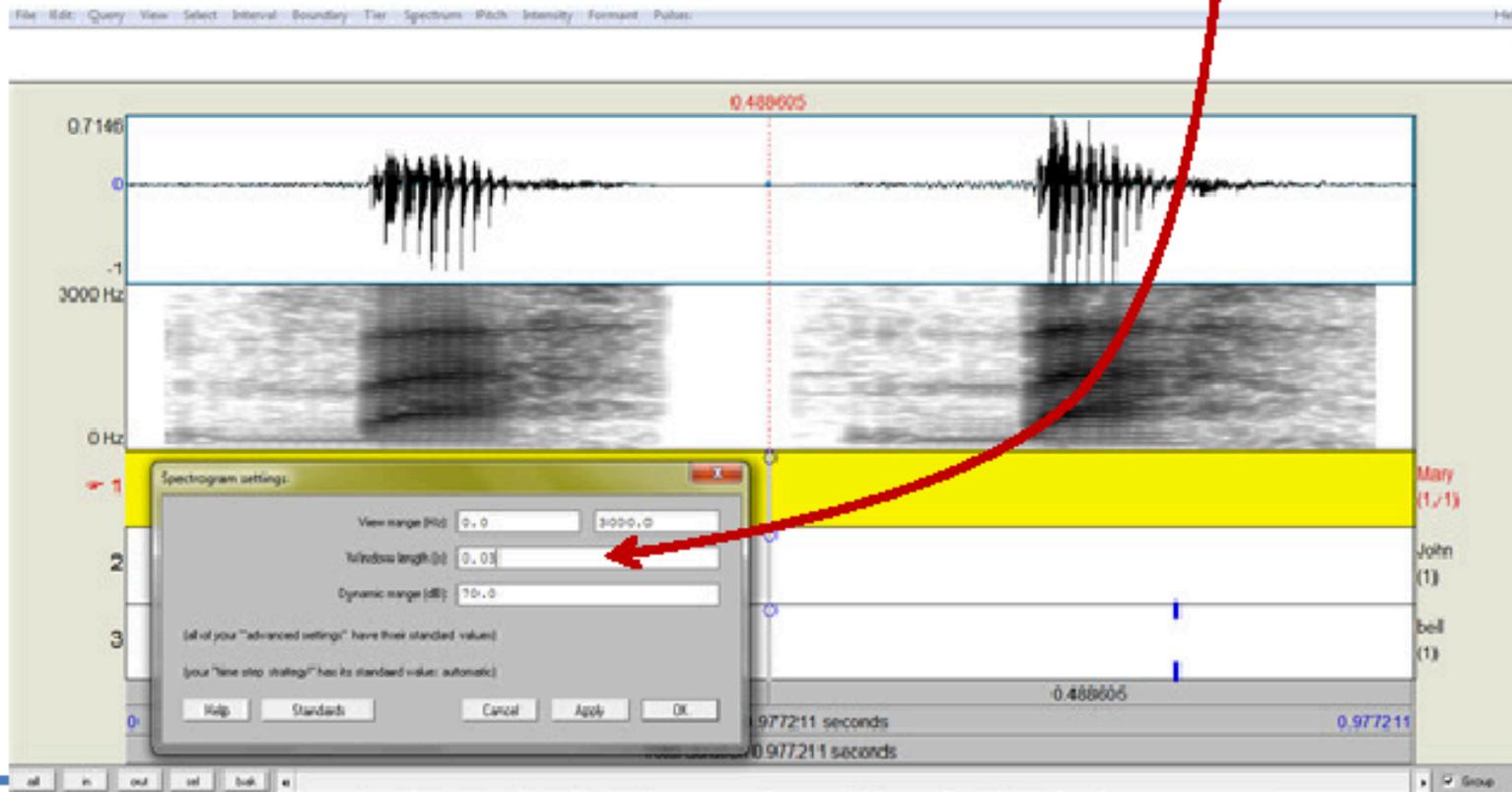
(a) Narrow and (b) wide-band analyses of the vowel [a]

Spectrogram

(Sound: Sounddatei 1)

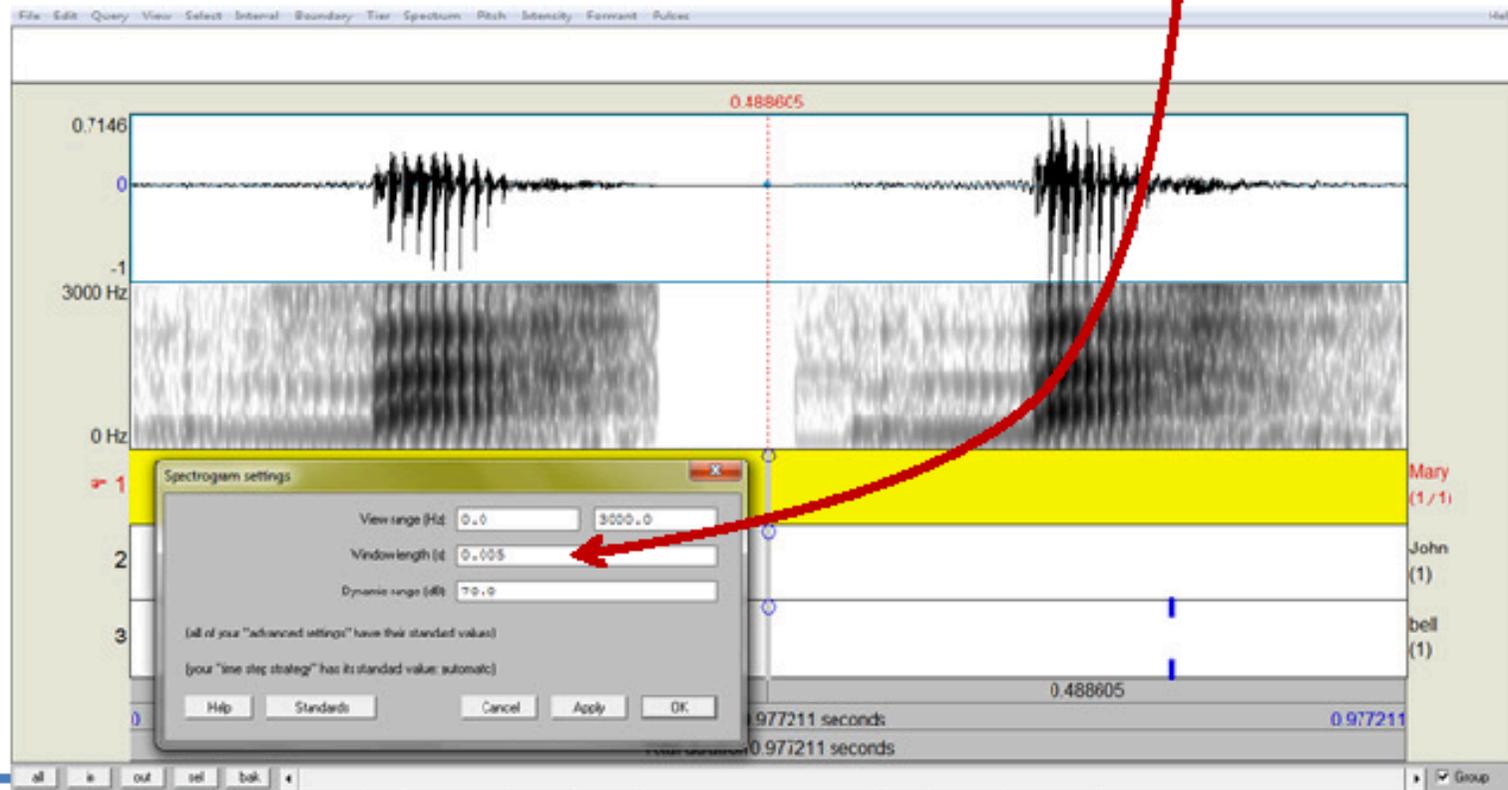
- Narrowband spectrogram (band width 50 Hz)
 - Higher frequency resolution
 - Representation of single harmonics
⇒ horizontal lines

Window length (s):
0.03



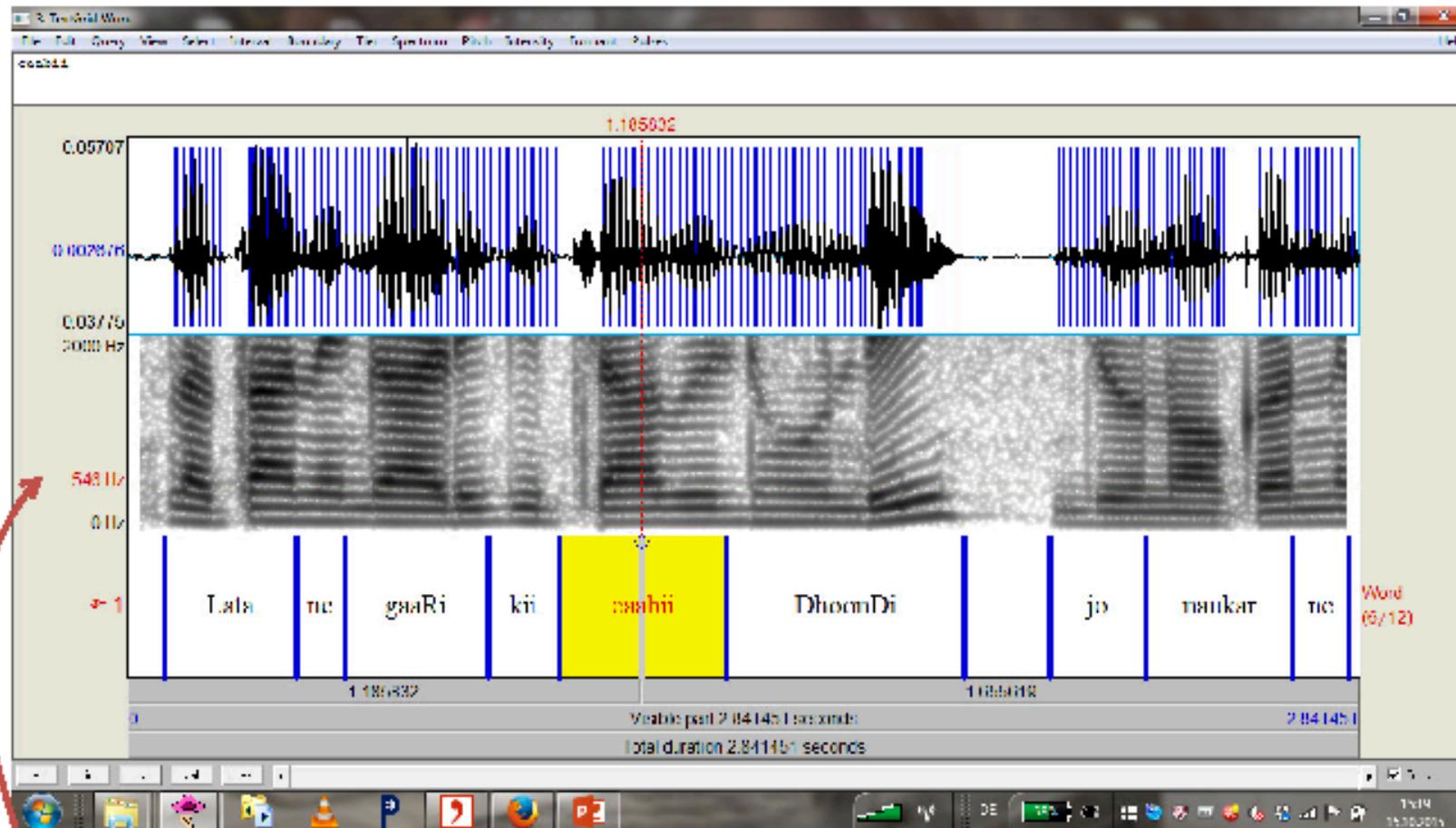
Spectrogram

- Broadband spectrogram (band width 3000 Hz)
 - Higher resolution in time
 - Representation of glottis vibration
⇒ vertical lines



F0 Bestimmung

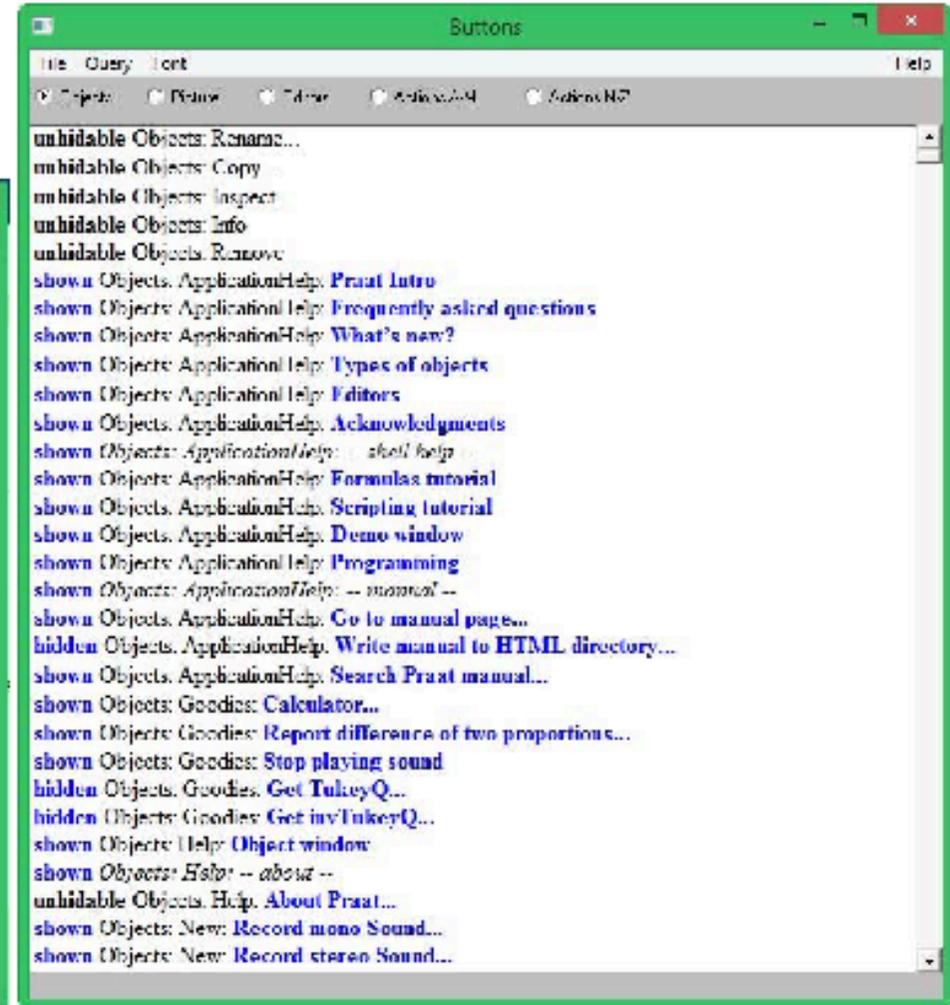
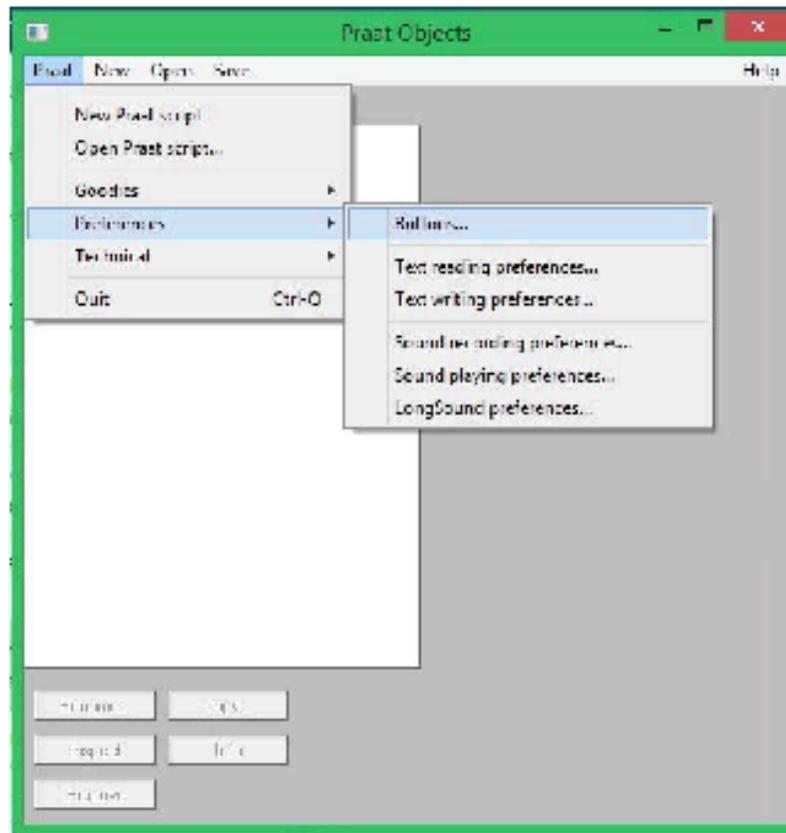
- Harmonische = ganzzahlige Vielfache der F0



4. Harmonische ~ 546 Hz: $546 / 4 = 136$ Hz

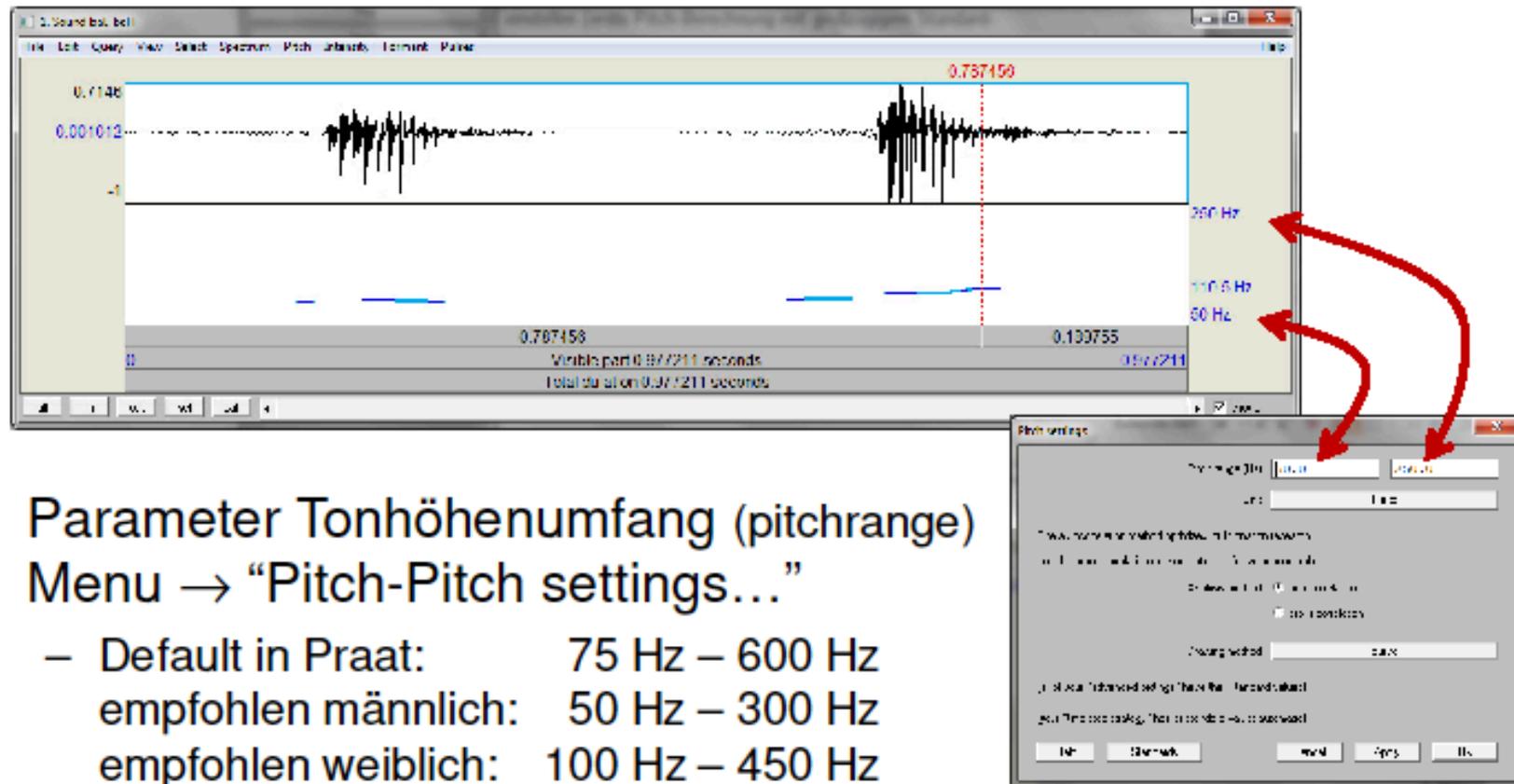
I. – Praat: First steps

- ◇ Buttons.ini
- ◇ Praat-preferences
buttons.ini



Praat – Analyse der F0

- Ton / Intonation: Tonhöhe (perzeptuell), F0 (akustisch, Hz)
- Melodieverlauf (*pitch contour*) in Praat (blaue Linie) im Sound Editor (Menu → “Pitch-Show pitch”)

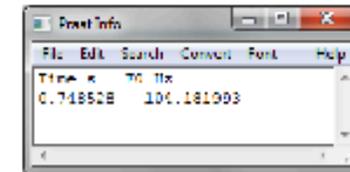
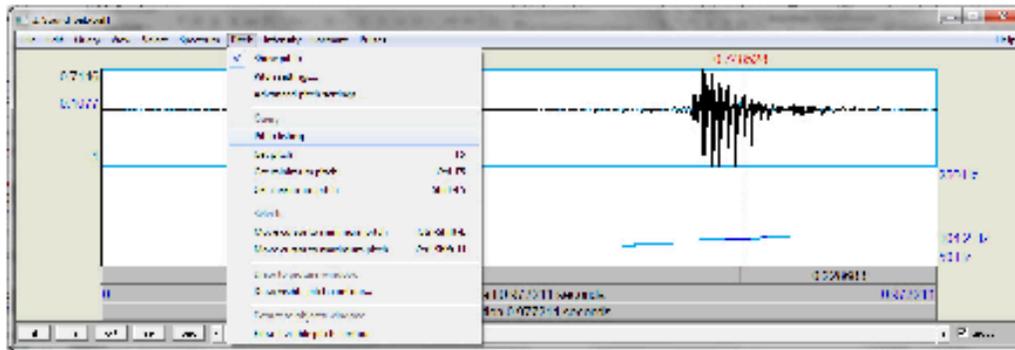


• Parameter Tonhöhenumfang (pitchrange)
Menu → “Pitch-Pitch settings...”

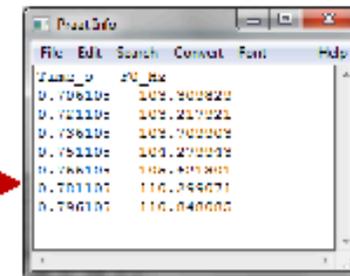
- Default in Praat: 75 Hz – 600 Hz
- empfohlen männlich: 50 Hz – 300 Hz
- empfohlen weiblich: 100 Hz – 450 Hz

Praat – Analyse der F0

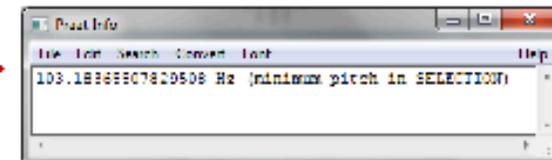
- Messung der F0 / eines Tons:
 - Cursor in die Mitte eines Vokals: Menu → “Pitch-Pitch listing”



- Auswahl des gesamten Vokals: “Pitch-Pitch listing”



- Menu → “get minimum pitch”
- Menu → “get maximum pitch”
- Voraussetzung: Auswahl eines Intervalls

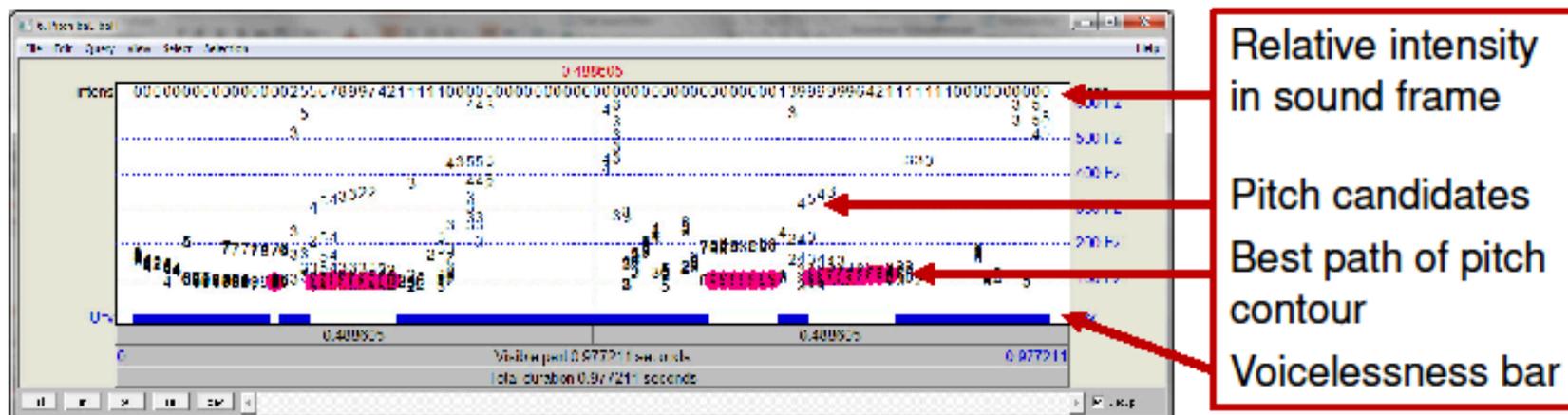


- “Move cursor to minimum/maximum pitch” vor Transcription eines Tons:

ÜBUNG: Transkribieren Sie den Text und Töne auf Oldenburg in „Sounddatei 2 „Oldenburg“ (1_1-1a.wav)

Praat – Analyse der F0

- Pitch object – für die präzise F0 Analyse (auch Praat scripting)
- Erzeugen eines Pitch object:
Sound auswählen, Menu → Analyse periodicity-To Pitch, OK



- Mögliche Änderung der F0 von Hand
Menu → Selection-Unvoice;
oder: Klicken auf die Ziffern
oder Befehl „change octave jumps“

Übungen

1. Übungen im Buch von Jörg Peters an: Kapiteln 1 und 2
2. Downloaden Sie Praat und explorieren Sie die Möglichkeiten.
Formulieren Sie ein Frage für die nächste Sitzung.