Praat Scripting Tutorial 2: TextGrid Boogaloo

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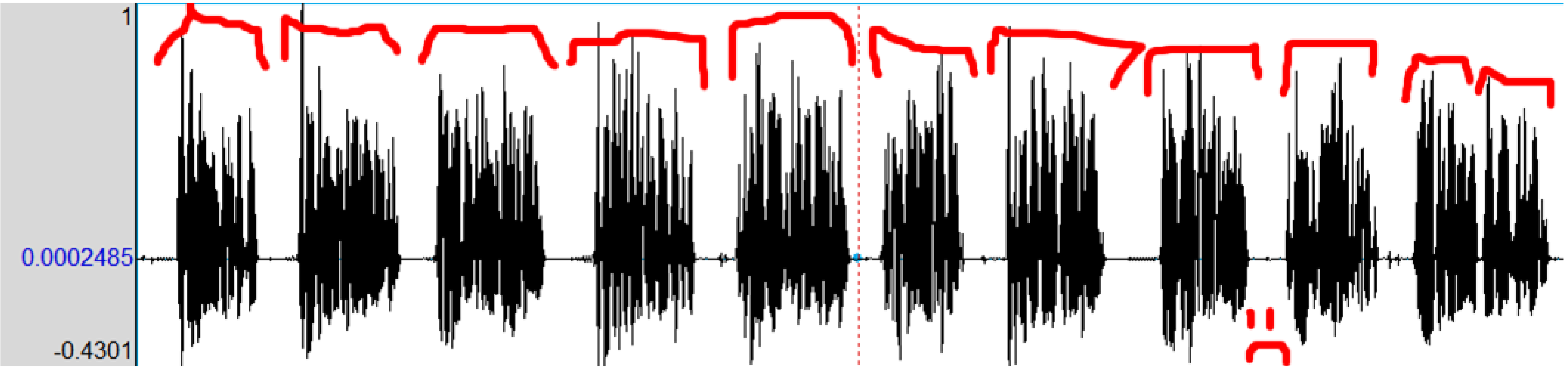
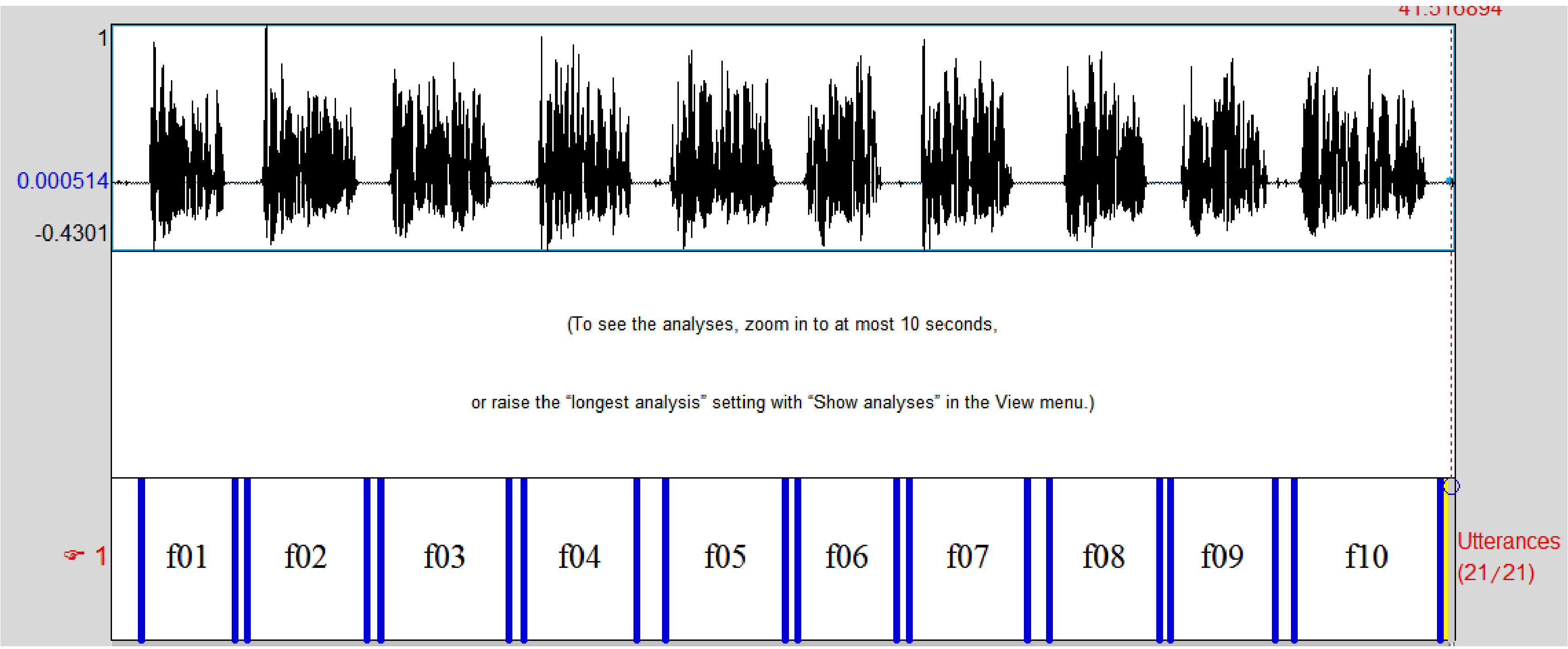
A Common Problem



Method 1: Select and Crop

- I could highlight each region corresponding to a sentence and use "Save selected sound as WAV file..."
- Disadvantages
  - What if you want to do something to each file before you save it?
  - Clicking through the menu time after time is surprisingly labor intensive.
  - What if you want to replicate what you've done?

Method 2: Use TextGrids!



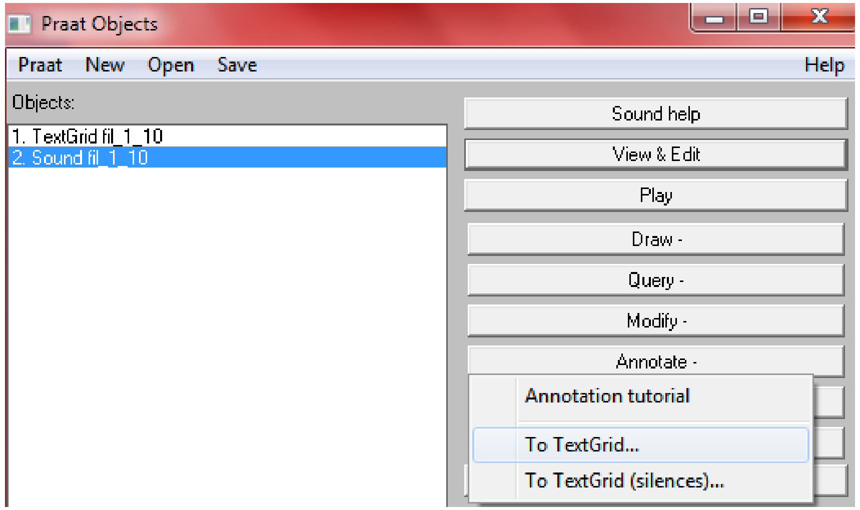
(To see the analyses, zoom in to at most 10 seconds,

or raise the “longest analysis” setting with “Show analyses” in the View menu.)

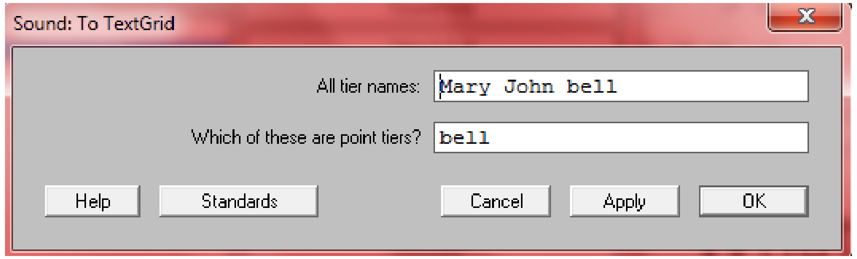
TextGrids: Advantages

- Can more easily do things to parts of files rather than files as a whole
- Can script things that take time to do
- Much, much easier to replicate
- Added bonus: making as many processes as possible automatic decreases the risk of error

What is a TextGrid?



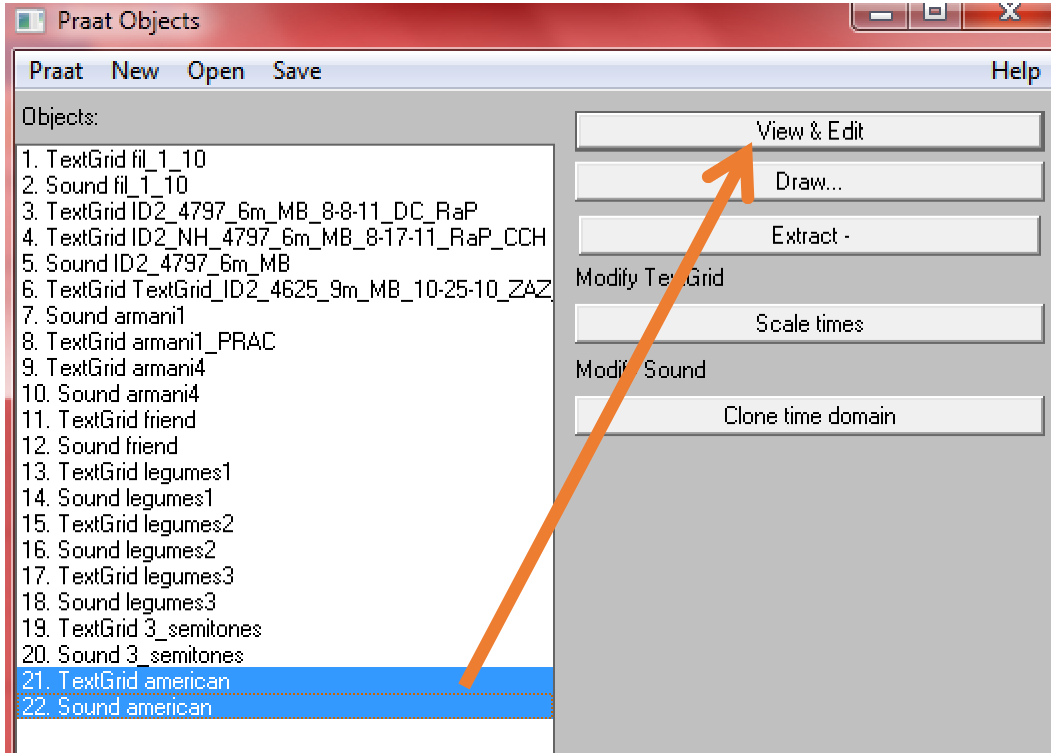
1. TextGrid fil_1_10
2. Sound fil_1_10



All tier names: Mary John bell

Which of these are point tiers? bell

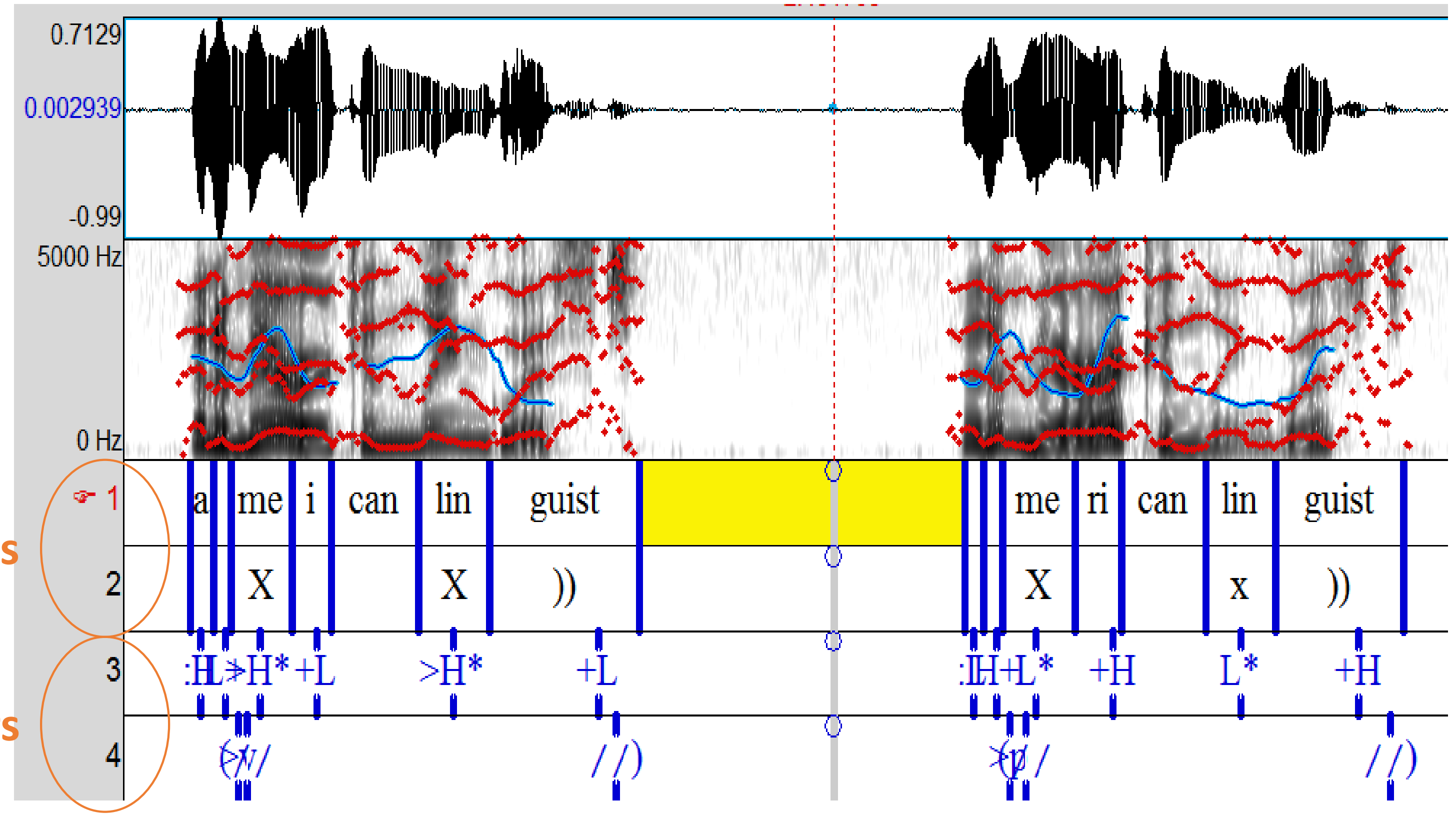
Opening a TextGrid with a Sound



Objects:

```
1. TextGrid fil_1_10
2. Sound fil_1_10
3. TextGrid ID2_4797_6m_MB_8-8-11_DC_RaP
4. TextGrid ID2_NH_4797_6m_MB_8-17-11_RaP_CCH
5. Sound ID2_4797_6m_MB
6. TextGrid TextGrid_ID2_4625_9m_MB_10-25-10_ZAZ
7. Sound armani1
8. TextGrid armani1_PRAC
9. TextGrid armani4
10. Sound armani4
11. TextGrid friend
12. Sound friend
13. TextGrid legumes1
14. Sound legumes1
15. TextGrid legumes2
16. Sound legumes2
17. TextGrid legumes3
18. Sound legumes3
19. TextGrid 3_semitones
20. Sound 3_semitones
21. TextGrid american
22. Sound american
```

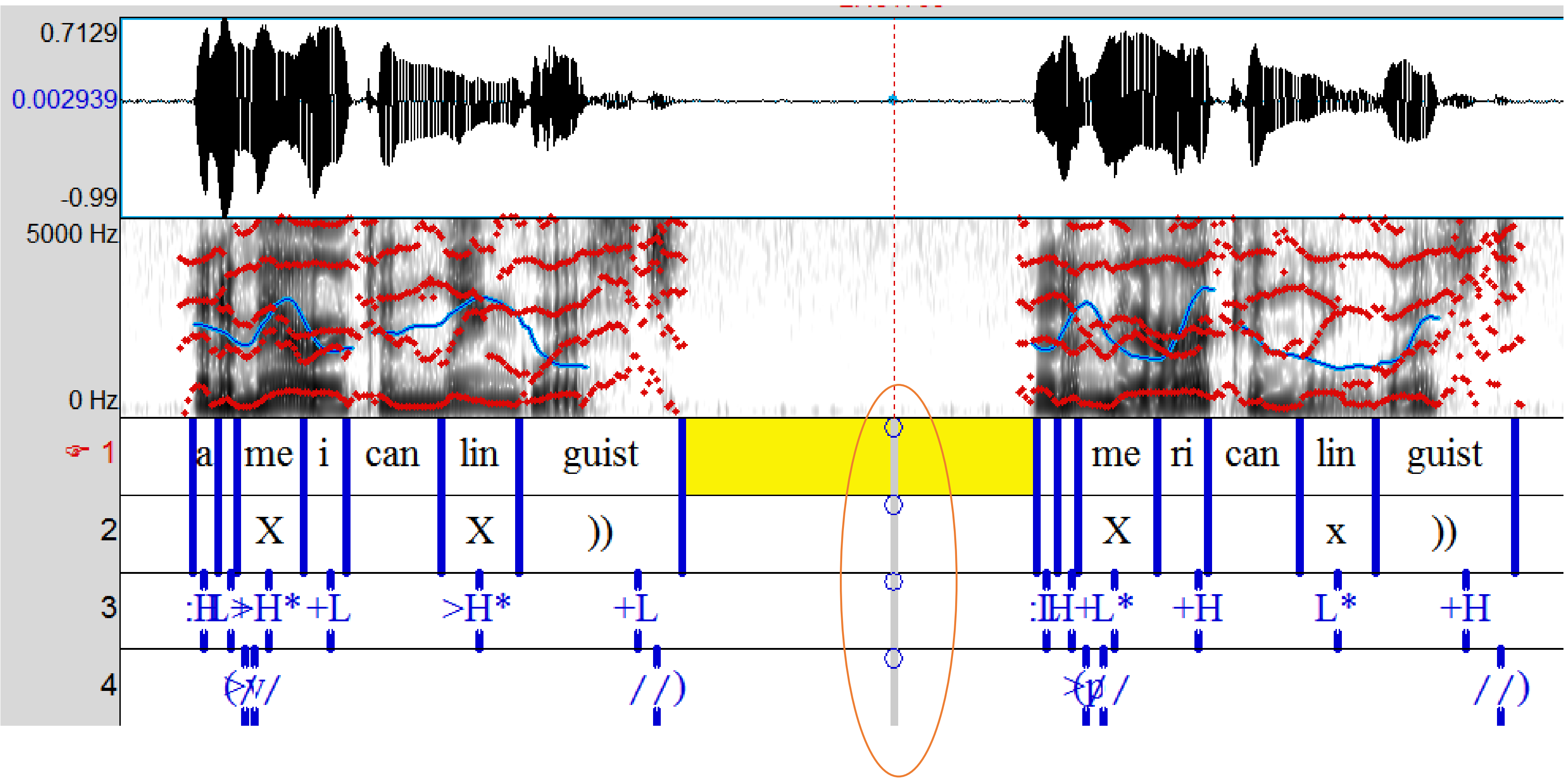
Tiers



Interval Tiers

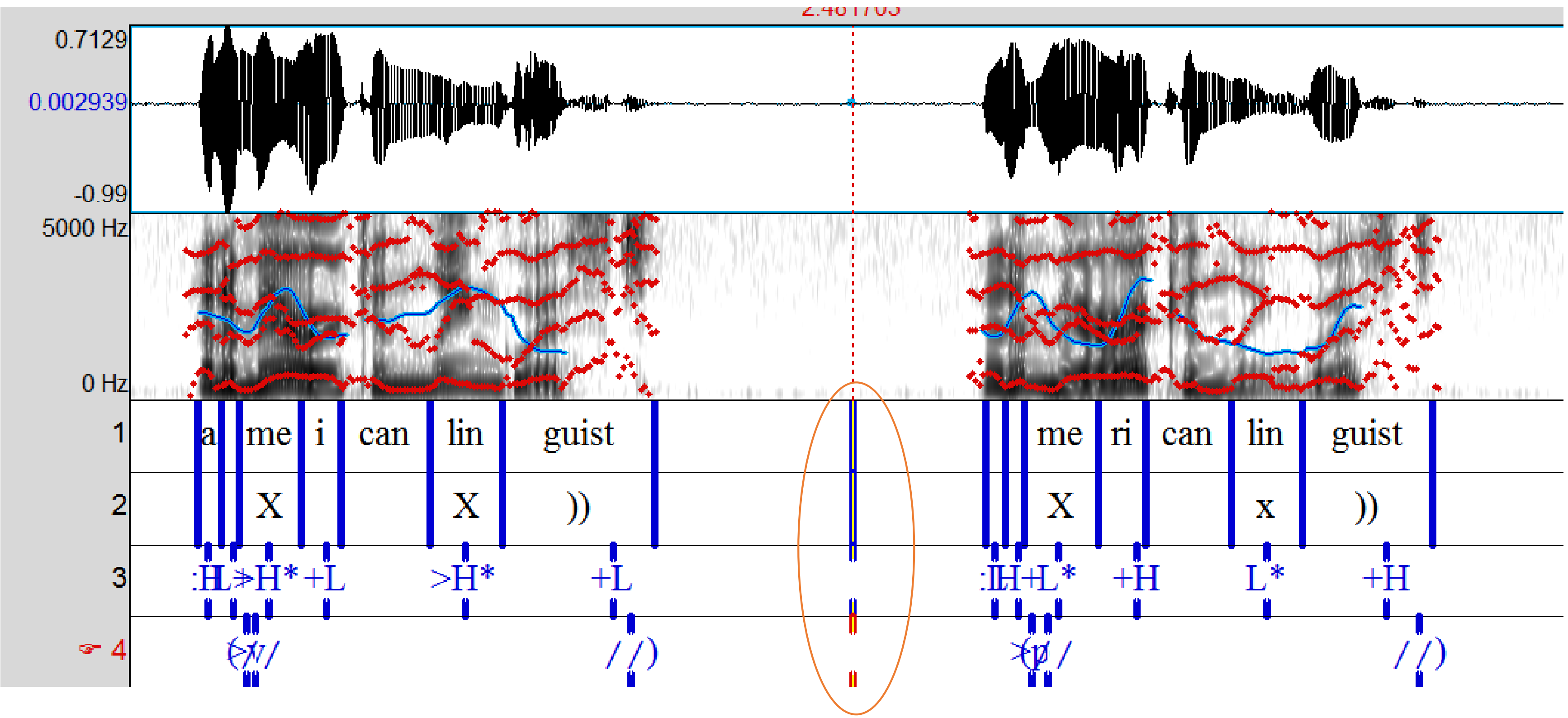
Point Tiers

Adding to Tiers

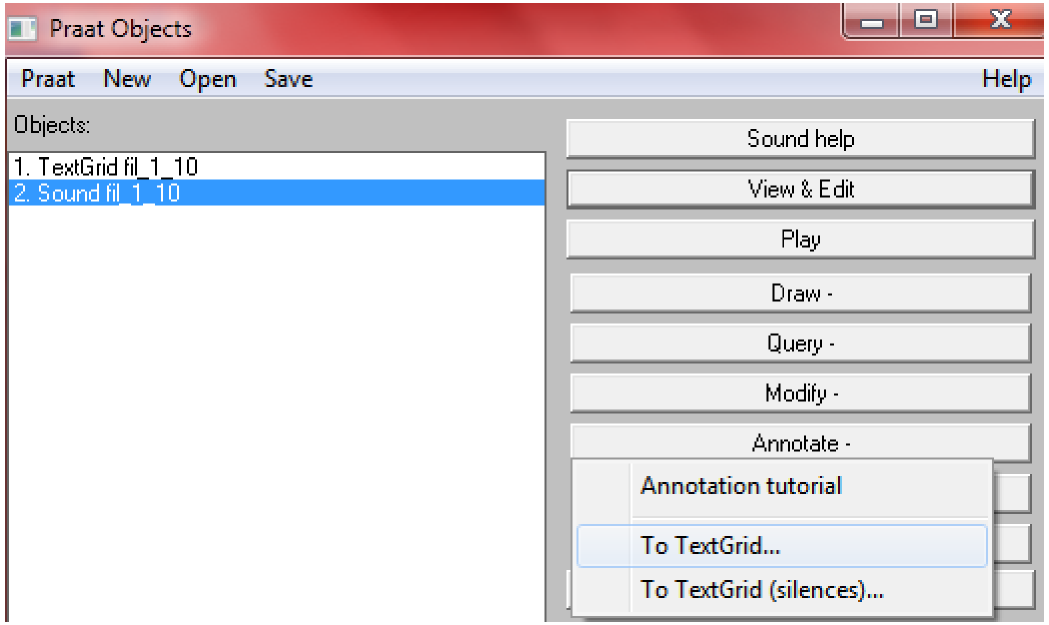


Keyboard Shortcuts!

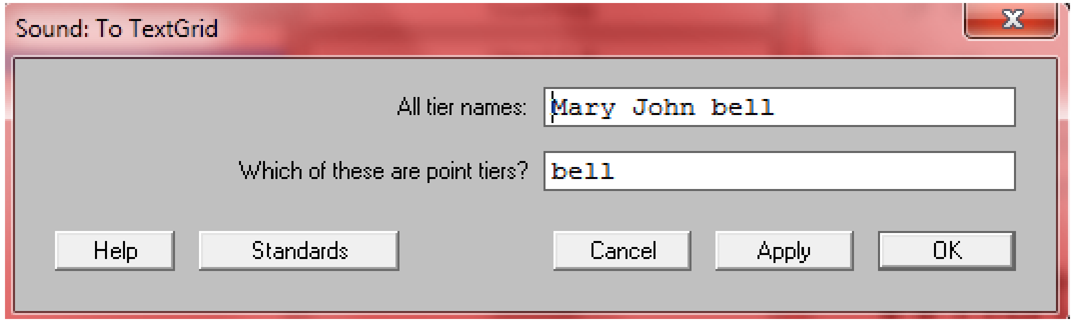
Adding to Tiers



Create a TextGrid



1. TextGrid fil_1_10
2. Sound fil_1_10



All tier names: Mary John bell

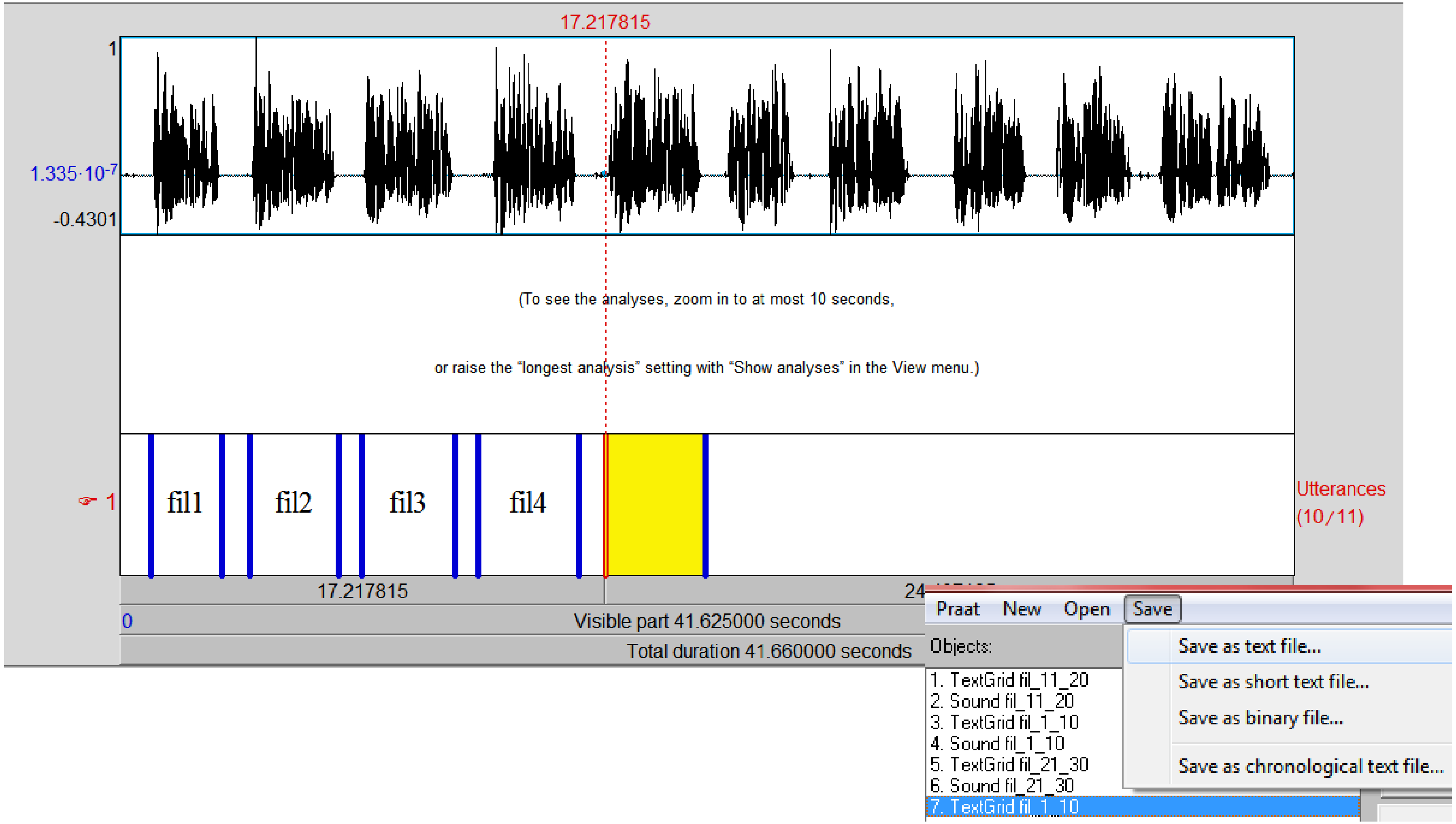
Which of these are point tiers? bell

Hands-On

Hands-On: Play with a TextGrid

- Open up any .wav file in the “data” folder
- Create a TextGrid
  - Tier 1: interval tier, label each word
  - Tier 2: point tier, label the end of each nasal sound
- Save it (do *not* give it the same name as the Sound file)

Using TextGrids and Scripting



(To see the analyses, zoom in to at most 10 seconds,

or raise the "longest analysis" setting with "Show analyses" in the View menu.)

1. TextGrid fil_11_20
2. Sound fil_11_20
3. TextGrid fil_1_10
4. Sound fil_1_10
5. TextGrid fil_21_30
6. Sound fil_21_30
7. TextGrid fil_1_10

Secret to Scripting: Recycling!

```
directory$ = "C:\Users\xanan\Box\praat_scripting_workshop\data\“
Create Strings as file list: "my_list", directory$ + "*.wav“
num_files = Get number of strings
for n from 1 to num_files
        selectObject: "Strings my_list“
        current_file$ = Get string: n
        Read from file: directory$ + current_file$
        name$ = selected$ ("Sound")
endfor
```

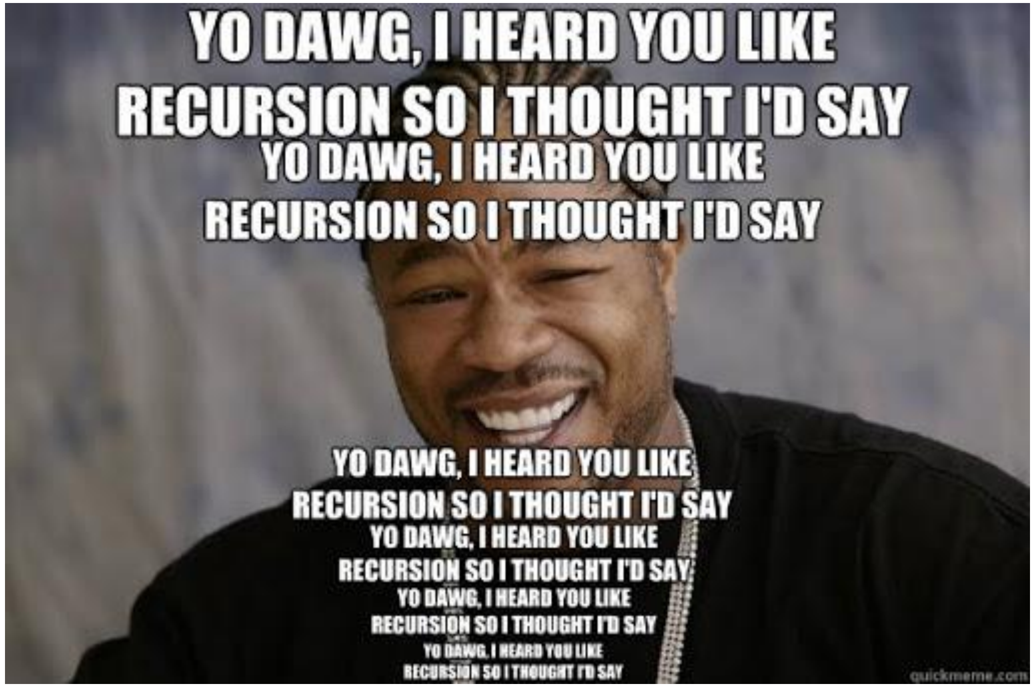
Reading TextGrids

```
directory$ = "C:\Users\xanan\Box\praat_scripting_workshop\data\“
Create Strings as file list: "my_list", directory$ + "*.wav“
num_files = Get number of strings
for n from 1 to num_files
        selectObject: "Strings my_list“
        current_file$ = Get string: n
        Read from file: directory$ + current_file$
        name$ = selected$ ("Sound")
        Read from file: directory$ + name$ + ".TextGrid"
endfor
```

What's the Logic?

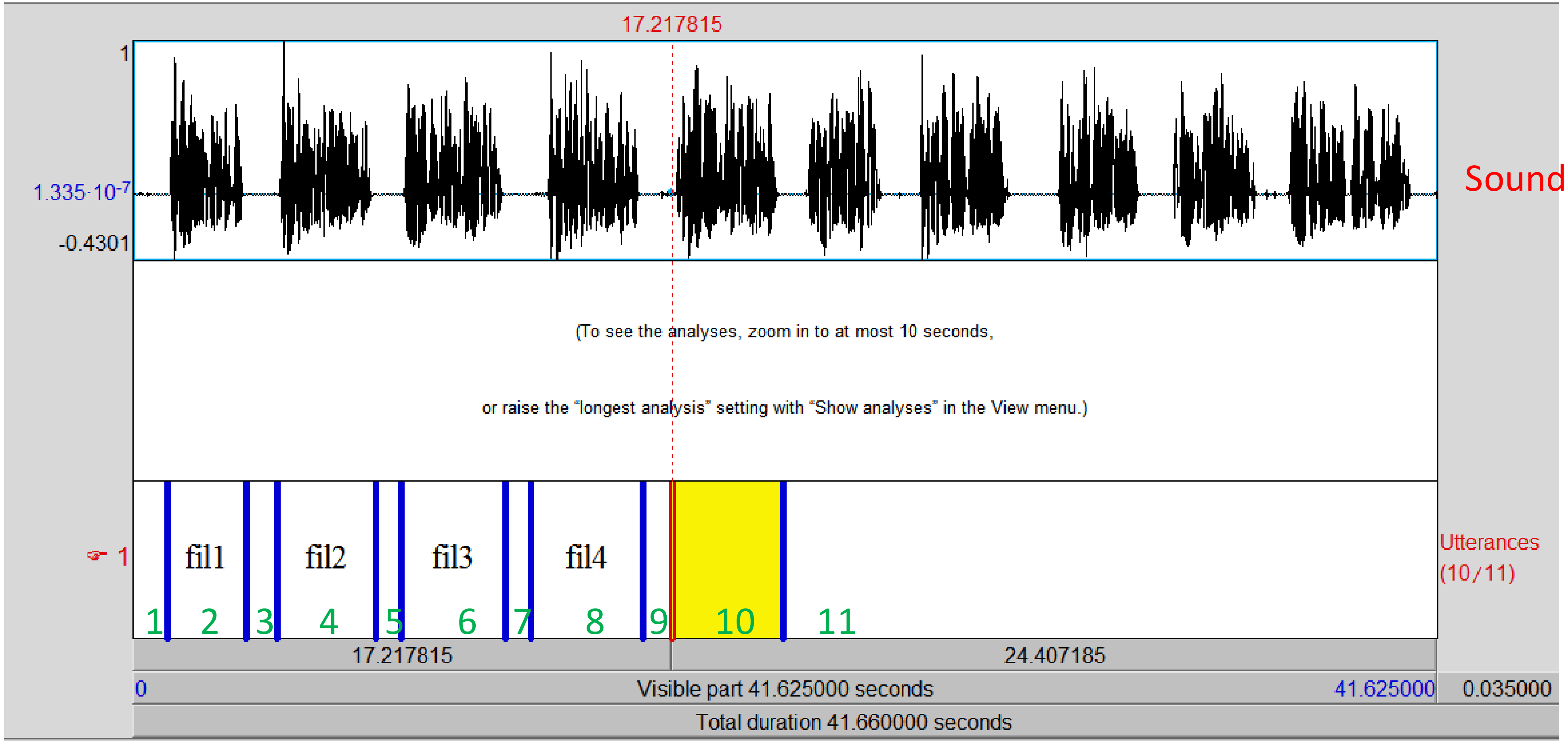
- ~~Take in the TextGrid~~
- Read through the intervals, one-by-one, and get their labels
- If the interval isn't blank...
    - Find the start and end of the interval
    - Use that information to grab the part of the file with sound in it
    - Rename that part with the name of the label
    - Save the resulting file

Nested For Loops


YO DAWG, I HEARD YOU LIKE
RECURSION SO I THOUGHT I'D SAY
YO DAWG, I HEARD YOU LIKE
RECURSION SO I THOUGHT I'D SAY
YO DAWG, I HEARD YOU LIKE
RECURSION SO I THOUGHT I'D SAY
YO DAWG, I HEARD YOU LIKE
RECURSION SO I THOUGHT I'D SAY
YO DAWG, I HEARD YOU LIKE
RECURSION SO I THOUGHT I'D SAY
YO DAWG, I HEARD YOU LIKE
RECURSION SO I THOUGHT I'D SAY
quickmeme.com

- We can embed for loops inside other for loops
- This is an instance of **recursion**
- Nested for loops will allow us to iterate through TextGrids for each sound file

Nested For Loops: Example



17.217815
1
1.335·10-7
-0.4301
(To see the analyses, zoom in to at most 10 seconds,
or raise the "longest analysis" setting with "Show analyses" in the View menu.)
1
fil1
fil2
fil3
fil4
Utterances
(10/11)
17.217815
24.407185
0
Visible part 41.625000 seconds
41.625000
0.035000
Total duration 41.660000 seconds

Sound File 1

Interval: 1 2 3 4 5 6 7 8 9 10 11

Nested For Loops: Syntax

```
for i from 1 to 5
    for j from 1 to 5
        # Do something here
    endfor
endfor
```

Nested For Loops: Toy Example

```
for i from 1 to 5
    for j from 1 to 5
        k = i + j
        printline ‘k’
    endfor
endfor
```

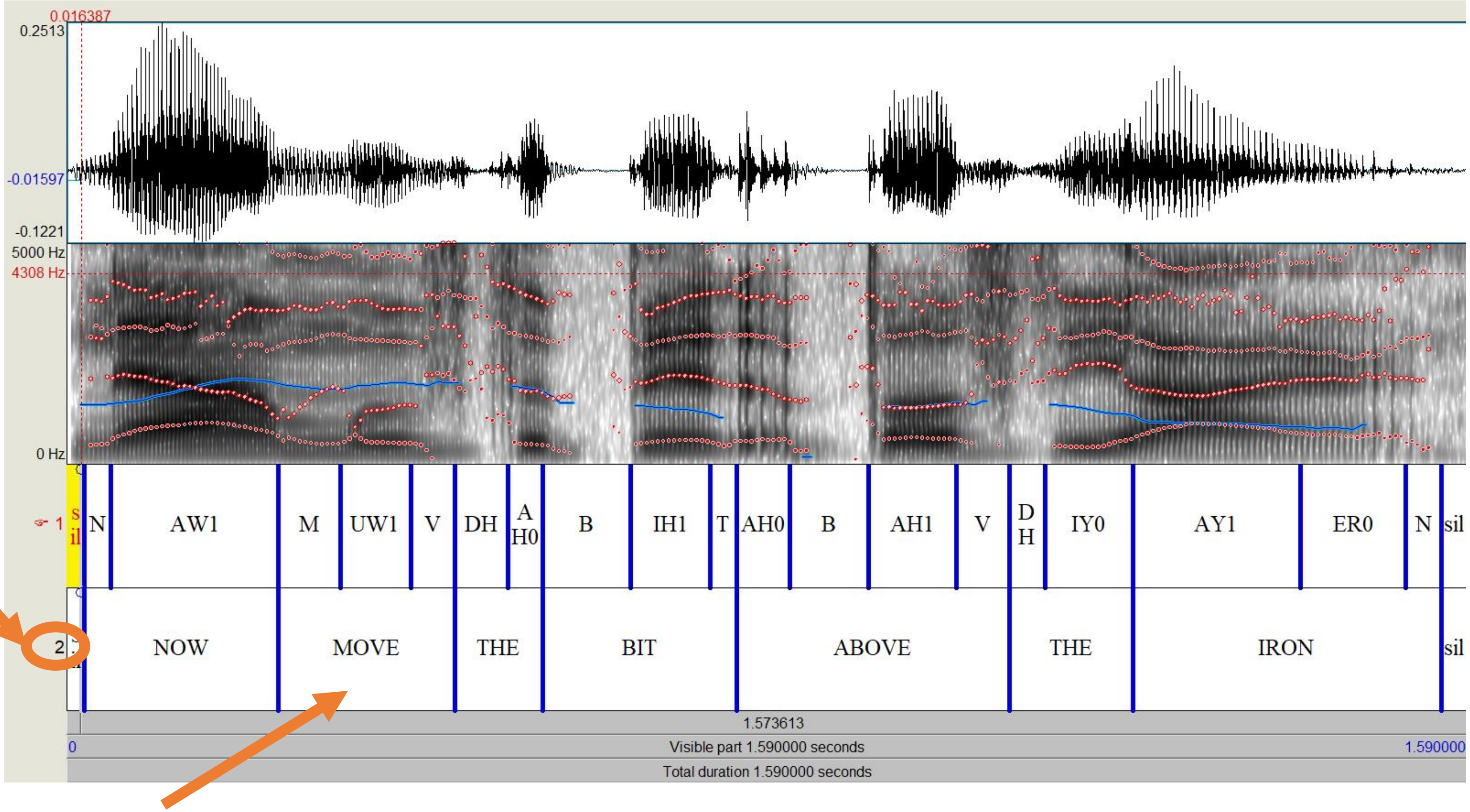
i	j	k
1	1	2
1	2	3
1	3	4
1	4	5
1	5	6
2	1	3
2	2	4
2	3	5
2	4	6

…

TextGrids and Scripting

```
directory$ = "C:\Users\xanan\Box\praat_scripting_workshop\data\“
Create Strings as file list: "my_list", directory$ + "*.wav“
num_files = Get number of strings
for n from 1 to num_files
        selectObject: "Strings my_list“
        current_file$ = Get string: n
        Read from file: directory$ + current_file$
        name$ = selected$ ("Sound")
        Read from file: directory$ + name$ + ".TextGrid"
        #Read through the intervals, one-by-one, and get their labels
        #If the interval isn't blank...
                #Find the start and end of the interval
                #Use that information to grab the part of the file with sound in it
                #Rename that part with the name of the label
                #Save the resulting file
endfor
```

Format of TextGrids



Relevant tier

Let’s grab each of these and save them as separate files

TextGrids and Scripting

```
directory$ = "C:\Users\xanan\Box\praat_scripting_workshop\data\“
Create Strings as file list: "my_list", directory$ + "*.wav“
num_files = Get number of strings
for n from 1 to num_files
        selectObject: "Strings my_list“
        current_file$ = Get string: n
        Read from file: directory$ + current_file$
        name$ = selected$ ("Sound")
        Read from file: directory$ + name$ + ".TextGrid“
        invlNum = Get number of intervals: 2
        #Read through the intervals, one-by-one, and get their labels
        #If the interval isn't blank...
                #Find the start and end of the interval
                #Use that information to grab the part of the file with sound in it
                #Rename that part with the name of the label
                #Save the resulting file
endfor
```

TextGrids and Scripting

```
directory$ = "C:\Users\xanan\Box\praat_scripting_workshop\data\“
Create Strings as file list: "my_list", directory$ + "*.wav“
num_files = Get number of strings
for n from 1 to num_files
        selectObject: "Strings my_list“
        current_file$ = Get string: n
        Read from file: directory$ + current_file$
        name$ = selected$ ("Sound")
        Read from file: directory$ + name$ + ".TextGrid“
        invlNum = Get number of intervals: 2
        for invl from 1 to invlNum
        #Read through the intervals, one-by-one, and get their labels
        #If the interval isn't blank...
                #Find the start and end of the interval
                #Use that information to grab the part of the file with sound in it
                #Rename that part with the name of the label
                #Save the resulting file
        endfor
endfor
```

TextGrids and Scripting

```
directory$ = "C:\Users\xanan\Box\praat_scripting_workshop\data\“
Create Strings as file list: "my_list", directory$ + "*.wav“
num_files = Get number of strings
for n from 1 to num_files
        selectObject: "Strings my_list“
        current_file$ = Get string: n
        Read from file: directory$ + current_file$
        name$ = selected$ ("Sound")
        Read from file: directory$ + name$ + ".TextGrid“
        invlNum = Get number of intervals: 2
        for invl from 1 to invlNum
                select TextGrid ‘name$'
                invlName$ = Get label of interval: 2, invl
                #If the interval isn't blank...
                        #Find the start and end of the interval
                        #Use that information  to grab the part of the file with sound in it
                        #Rename that part with the name of the label
                        #Save the resulting  file
        endfor
endfor
```

if Statements: Syntax

```
if (condition)
        (action)
endif
```

If the condition is fulfilled, perform the given action.

Example conditions:

x = y: x is equal to y

x <> y: x is not equal to y

x > y: x is greater than y

etc.

http://www.fon.hum.uva.nl/praat/manual/Scripting_5_3__Jumps.html

if Statements

```
if (Condition A)
        (Action A)
elsif (Condition B)
        (Action B)
else
        (Action C)
endif
```

- elsif:
  - If Condition A is not true **BUT**
  - Condition B is true…
  - Do Action B
- else:
  - If Condition A is not true **AND**
  - Condition B is not true **AND**
  - …any other conditions are not true…
  - Do Action C

If Statements: Toy Example

```
for i from 1 to 5
    for j from 1 to 5
        k = i + j
        if k < 4
            printline “Yay!”
        elsif j > 2
            printline “Boo!”
        else
            printline “Wow!”
        endif
    endfor
endfor
```

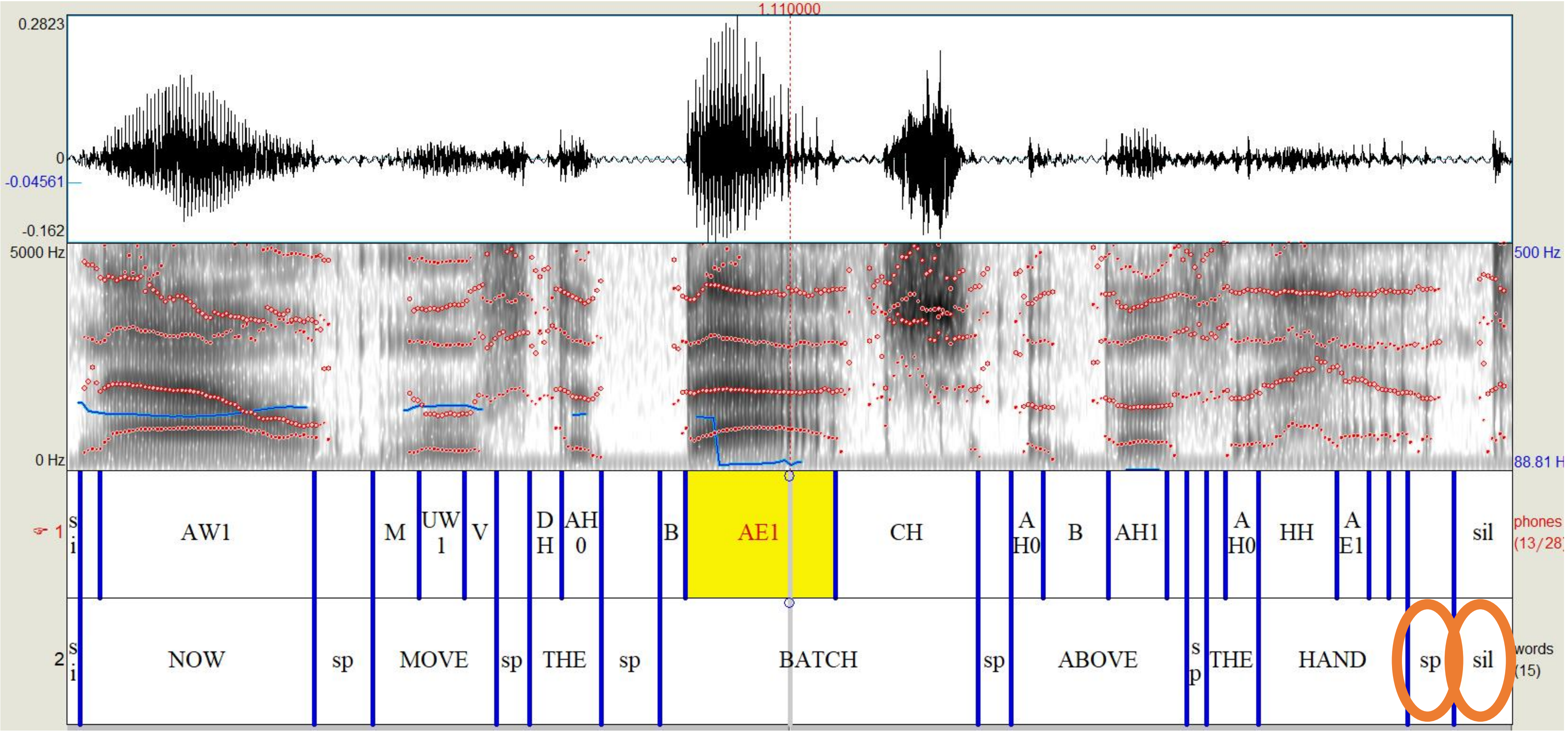
i	j	k	printline
1	1	2	Yay!
1	2	3	Yay!
1	3	4	Boo!
1	4	5	Boo!
1	5	6	Boo!
2	1	3	Yay!
2	2	4	Wow!
2	3	5	Boo!
2	4	6	Boo!

If Statements: Toy Example

```
for i from 1 to 5
    for j from 1 to 5
        k = i + j
        if k < 4
            printline “Yay!”
        elsif j > 1
            printline “Boo!”
        else
            printline “Wow!”
        endif
    endfor
endfor
```

i	j	k	printline
1	1	2	Yay!
1	2	3	Yay!
1	3	4	Boo!
1	4	5	Boo!
1	5	6	Boo!
2	1	3	Yay!
2	2	4	Boo!
2	3	5	Boo!
2	4	6	Boo!

Making Sure It Isn’t Blank



Logical Operators: Syntax

- not: that condition is *not* true
- and: that condition is true *and* another condition is true
- or: that condition is true *or* another condition is true (this is “logical or”: may be Condition A, Condition B, or both)

Logical Operators: Toy Example

```
for i from 1 to 5
    for j from 1 to 5
        k = i + j
        if (k < 4) and (j > 1)
            println “Yay!”
        elsif (j > 2) or (i > 1)
            println “Boo!”
        elsif not (k > 3)
            println “Wow!”
        else
            println “Eek!”
        endif
    endfor
endfor
```

i	j	k	println
1	1	2	Wow!
1	2	3	Yay!
1	3	4	Boo!
1	4	5	Boo!
1	5	6	Boo!
2	1	3	Boo!
2	2	4	Boo!
2	3	5	Boo!
2	4	6	Boo!

TextGrids and Scripting

```
for invl from 1 to invlNum
    select TextGrid ‘name$'
    invlName$ = Get label of interval: 2, invl
    if (invlName$ <> "sil") and (invlName$ <> "sp")
        #Find the start and end of the interval
        #Use that information to grab the part of the file with sound in it
        #Rename that part with the name of the label
        #Save the resulting file
    endif
endfor
```

TextGrids and Scripting

```
for invl from 1 to invlNum
    select TextGrid ‘name$'
    invlName$ = Get label of interval: 2, invl
    if (invlName$ <> "sil") and (invlName$ <> "sp")
        invlStart = Get starting point: 2, invl
        invlStops = Get end point: 2, invl
        #Use that information to grab the part of the file with sound in it
        #Rename that part with the name of the label
        #Save the resulting file
    endif
endfor
```

TextGrids and Scripting

```
for invl from 1 to invlNum
    select TextGrid ‘name$'
    invlName$ = Get label of interval: 2, invl
    if (invlName$ <> "sil") and (invlName$ <> "sp")
        invlStart = Get starting point: 2, invl
        invlStops = Get end point: 2, invl
        select Sound ‘name$'
        Edit
        #Use that information to grab the part of the file with sound in it
        Close
        #Rename that part with the name of the label
        #Save the resulting file
    endif
endfor
```

TextGrids and Scripting

```
for invl from 1 to invlNum
    select TextGrid ‘name$'
    invlName$ = Get label of interval: 2, invl
    if (invlName$ <> "sil") and (invlName$ <> "sp")
        invlStart = Get starting point: 2, invl
        invlStops = Get end point: 2, invl
        select Sound ‘name$'
        Edit
        editor Sound ‘name$'
        #Extract the selected sound
        Close
        endeditor
        #Rename that part with the name of the label
        #Save the resulting file
    endif
endfor
```

Yeah, I dunno either.

Opening the Editor

- You need that editor/endeditor function while working with things inside the window
- There are things you can do only inside a window, so it's sadly necessary sometimes
- Still, it's also computationally intensive and will slow things down
- When in doubt, try to avoid opening an editor window

TextGrids and Scripting

```
for invl from 1 to invlNum
    select TextGrid ‘name$'
    invlName$ = Get label of interval: 2, invl
    if (invlName$ <> "sil") and (invlName$ <> "sp")
        invlStart = Get starting point: 2, invl
        invlStops = Get end point: 2, invl
        select Sound ‘name$'
        Edit
        editor Sound ‘name$'
            Select... invlStart invlStops
            Extract selected sound (time from 0)
        Close
        endeditor
        #Rename that part with the name of the label
        #Save the resulting file
    endif
endfor
```

TextGrids and Scripting

```
for invl from 1 to invlNum
    select TextGrid ‘name$'
    invlName$ = Get label of interval: 2, invl
    if (invlName$ <> "sil") and (invlName$ <> "sp")
        invlStart = Get starting point: 2, invl
        invlStops = Get end point: 2, invl
        select Sound ‘name$'
        Edit
        editor Sound ‘name$'
            Select... invlStart invlStops
            Extract selected sound (time from 0)
        Close
        endeditor
        Rename... 'invlName$'
        #Save the resulting file
    endif
endfor
```

Goals

- Level 1: print out the name and duration of each word, along with the file it came from
  - Level 1A: do it just by adding code in
  - Level 1B: do it while also getting rid of the pernicious editor
- Level 2: extract and save each word with a filename corresponding to the file it came from and the label of the word
- Level 3: print the name and duration of each vowel, along with the file it came from
  - You may need to know the **right$** function
- Level 4: print the name and duration of each vowel, along with the **word** and the file that it came from
- Level 5: use a form to extract and save all repetitions of a word of your choice from each file, using a filename that is consecutively numbered (e.g., “THE_1”, “THE_2”, “THE_3”…)

Level 1A

```
for invl from 1 to invlNum
        select TextGrid ‘name$'
        invlName$ = Get label of interval: 2, invl
        if (invlName$ <> "sil") and (invlName$ <> "sp")
                invlStart = Get starting point: 2, invl
                invlStops = Get end point: 2, invl
                select Sound ‘name$'
                Edit
                editor Sound ‘name$'
                        Select... invlStart invlStops
                        Extract selected sound (time from 0)
                Close
                endeditor
                Rename... 'invlName$'
                invlDur = Get total duration
                printline 'name$''tab$''invlName$''tab$''invlDur'
        endif
endfor
```

Level 1B

```
for invl from 1 to invlNum
        select TextGrid 'name$'
        invlName$ = Get label of interval: 2, invl
        if (invlName$ <> "sil") and (invlName$ <> "sp")
                invlStart = Get starting point: 2, invl
                invlStops = Get end point: 2,  invl
                invlDur = invlStops - invlStart
                printline 'name$''tab$''invlName$''tab$''invlDur'
        endif
endfor
```

Level 2

```
for invl from 1 to invlNum
    select TextGrid 'name$'
    invlName$ = Get label of interval: 2, invl
    if (invlName$ <> "sil") and (invlName$ <> "sp")
        invlStart = Get starting point: 2, invl
        invlStops = Get end point: 2, invl
        select Sound 'name$'
        Edit
        editor Sound 'name$'
            Select... invlStart invlStops
            Extract selected sound (time from 0)
        Close
        endeditor
        Rename... 'invlName$'
        Save as WAV file: directory$ + name$ + "_" + invlName$ + ".wav"
    endif
endfor
```

Level 3

```
invlNum = Get number of intervals: 1
for invl from 1 to invlNum
        select TextGrid 'name$'
        invlName$ = Get label of interval: 1, invl
        if (right$ (invlName$) = "0") or (right$ (invlName$) = "1") or (right$ (invlName$) = "2")
                invlStart = Get starting point: 1, invl
                invlStops = Get end point: 1, invl
                select Sound 'name$'
                Edit
                editor Sound 'name$'
                        Select... invlStart invlStops
                        Extract selected sound (time from 0)
                Close
                endeditor
                Rename... 'invlName$'
                invlDur = Get total duration
                printline 'name$''tab$''invlName$''tab$''invlDur'
        endif
endfor
```

Level 4

```
invlNum = Get number of intervals: 1
for invl from 1 to invlNum
    select TextGrid 'name$'
    invlName$ = Get label of interval: 1, invl
    if (right$ (invlName$) == "0") or (right$ (invlName$) == "1") or (right$ (invlName$) == "2")
        invlStart = Get starting point: 1, invl
        invlStops = Get end point: 1, invl
        wordInvlatStart = Get interval at time: 2, invlStart
        wordName$ = Get label of interval: 2, wordInvlatStart
        select Sound 'name$'
        Edit
        editor Sound 'name$'
            Select... invlStart invlStops
            Extract selected sound (time from 0)
        Close
        endeditor
        Rename... 'invlName$'
        invlDur = Get total duration
        printline 'name$''tab$''wordName$''tab$''invlName$''tab$''invlDur'
    endif
endfor
```

Level 5

```
form Choose a word!
        sentence Target_word THE
endform

wordCounter = 0
```

```
for invl from 1 to invlNum
        select TextGrid 'name$'
        invlName$ = Get label of interval: 2, invl
        if (invlName$ = target_word$)
                wordCounter = wordCounter + 1
                invlStart = Get starting point: 2, invl
                invlStops = Get end point: 2, invl
                select Sound 'name$'
                Edit
                editor Sound 'name$'
                        Select... invlStart
invlStops
                        Extract selected
sound (time from 0)
                Close
                endeditor
                Rename...
    'invlName$'_'wordCounter'
                Save as WAV file: directory$ +
    invlName$ + "_" + 'wordCounter' + ".wav"
        endif
endfor
```

Thank You!