

Appendix C – Praat scripts

Script used in section 5.2.3

```
#####
### relative_peaks_elqud.praat
###
### Timo Buchholz
### timobuch@zedat.fu-berlin.de
### April 2021
###
###
### Praat 6.1.16
#####
form Select directories (without final slash)
    comment Where are the WAV files kept?
    sentence wav_dir C:\User\Folder
    comment Where are the TextGrid files kept?
    sentence txt_dir C:\User\Folder
    comment Where should the results file be kept?
    sentence directory C:\User\Folder
    comment Where are the pitch files kept?
    sentence pitch_dir C:\User\Folder

endform

# Create TXT file with header
filedelete 'directory$/results.txt
header_row$ = "File" + tab$ + "Word.label" + tab$ +
... "number.all.acc.syls.utterance" + tab$ +
... "start.time.utterance" + tab$ + "end.time.utterance" + tab$ +
... "length.utterance" + tab$ + "acc.syl.label" + tab$ + "contrast.on.acc.syl.
word" + tab$ + "number.this.acc.syl.utterance" + tab$ + "utterance.part" + tab$ +
"wordclass" + tab$ + "start.acc.syl" + tab$ +
... "end.acc.syl" + tab$ + "length.acc.syl" + tab$ + "meanf0.accsyl" + tab$ +
... "position.max.acc.syl" + tab$ + "position.min.acc.syl" + tab$ +
... "maximum.acc.syl" + tab$ + "minimum.acc.syl" + tab$ +
... "mean.first.pretonic.fifth" + tab$ + "mean.second.pretonic.fifth" + tab$ +
... "mean.third.pretonic.fifth" + tab$ + "mean.fourth.pretonic.fifth" + tab$ +
... "mean.fifth.pretonic.fifth" + tab$ + "trans.meanf0.accsyl" + tab$ +
... "trans.maxf0.accsyl" + tab$ + "trans.minf0.accsyl" + tab$ +
... "trans.first.pretonic.fifth" + tab$ + "trans.second.pretonic.fifth" + tab$ +
... "trans.third.pretonic.fifth" + tab$ + "trans.fourth.pretonic.fifth" + tab$ +
... "trans.fifth.pretonic.fifth" + tab$ +
... "start.time.word" + tab$ + "end.time.word" + tab$ +
... "length.word" + tab$ + "label.first.utt.extreme" + tab$ +
... "label.second.utt.extreme" + tab$ + "utterance.maxim" + tab$ +
... "utterance.minimum" + tab$ + "pos.utterance.maximum" + tab$ +
... "pos.utterance.minimum" + tab$ + "word.end.topic1" + tab$ +
... "start.endsyl.topic1" + tab$ + "end.endsyl.topic1" + tab$ +
```

```

... "meanf0.endsyl.topic1" + tab$ + "maxf0.endsyl.topic1" + tab$ +
... "pos.max.endsyl.topic1" + tab$ + "minf0.endsyl.topic1" + tab$ + "pos.min.
endsyl.topic1" + tab$ + "trans.meanf0.endsyl.topic1" + tab$ +
... "trans.maxf0.endsyl.topic1" + tab$ + "trans.minf0.endsyl.topic1" + tab$ +
"word.end.comment1" + tab$ +
... "start.endsyl.comment1" + tab$ + "end.endsyl.comment1" + tab$ +
... "meanf0.endsyl.comment1" + tab$ + "maxf0.endsyl.comment1" + tab$ +
... "pos.max.endsyl.comment1" + tab$ + "minf0.endsyl.comment1" + tab$ + "pos.min.
endsyl.comment1" + tab$ + "trans.meanf0.endsyl.comment1" + tab$ +
... "trans.maxf0.endsyl.comment1" + tab$ + "trans.minf0.endsyl.comment1" + tab$ +
"word.end.topic2" + tab$ +
... "start.endsyl.topic2" + tab$ + "end.endsyl.topic2" + tab$ +
... "meanf0.endsyl.topic2" + tab$ + "maxf0.endsyl.topic2" + tab$ +
... "pos.max.endsyl.topic2" + tab$ + "minf0.endsyl.topic2" + tab$ + "pos.min.
endsyl.topic2" + tab$ + "trans.meanf0.endsyl.topic2" + tab$ +
... "trans.maxf0.endsyl.topic2" + tab$ + "trans.minf0.endsyl.topic2" + tab$ +
"word.end.comment2" + tab$ +
... "start.endsyl.comment2" + tab$ + "end.endsyl.comment2" + tab$ +
... "meanf0.endsyl.comment2" + tab$ + "maxf0.endsyl.comment2" + tab$ +
... "pos.max.endsyl.comment2" + tab$ + "minf0.endsyl.comment2" + tab$ + "pos.min.
endsyl.comment2" + tab$ + "trans.meanf0.endsyl.comment2" + tab$ +
... "trans.maxf0.endsyl.comment2" + tab$ + "trans.minf0.endsyl.comment2" + tab$ +
... newline$
header_row$ > 'directory$'/results.txt

```

#Check whether there are pitch files already that have been used and corrected manually before WARNING: You must have one pitch file per each wav file for this to work. If you don't, the script will overwrite your existing pitch files

List all pitch files

```

Create Strings as file list... list 'pitch_dir$'/*.Pitch
numberOfPitchfiles = Get number of strings

```

```

# List all WAV files
Create Strings as file list... list 'wav_dir$'/*.wav
numberOfFiles = Get number of strings

```

Loop that goes through all files

```

for ifile to numberOfFiles
  select Strings list
  fileName$ = Get string... ifile
  baseName$ = fileName$ - ".wav"
  # Read in the Sound files with that base name
  Read from file... 'wav_dir$'/'baseName$'.wav
  Read from file... 'txt_dir$'/'baseName$'.TextGrid

```

```

## hash the if-clause optionally if you know all the files have pitch files
anyway, and only keep the "read from file..." line

#       if 'numberOfPitchfiles' = 'numberOfFiles'

                Read from file... 'txt_dir$'/'baseName$'.Pitch
#       else

# # Create Pitch object
#       select Sound 'baseName$'
#       To Pitch (ac)... 0.005 75 15 no 0.03 0.6 0.01 0.35 0.30 600
#       endif

# Select the individual words

        selectObject: "TextGrid 'baseName$'"
        plusObject: "Sound 'baseName$'"
        Scale times

        select TextGrid 'baseName$'

# Get start and end times for utterance (including pauses)

        nintervalbottomtier = Get number of intervals... 4
        startutterance = Get starting point... 4 2
        endutterance = Get end point... 4 'nintervalbottomtier'-1
        lengthutterance = (endutterance - startutterance)*1000

#Get number of accented syllables in utterance

        naccsylvtier = Get number of intervals... 2
        nemptyintervalaccsylvtier = Count intervals where: 2, "is equal to", ""
        naccsylys = 'naccsylvtier' - 'nemptyintervalaccsylvtier'

# look at pitch object and see if it has any obvious errors

        select Pitch 'baseName$'

        Shift times to: "start time", 0

# hash out the following view & edit and pause lines if you already checked all
the pitch files and just want to generate the results

#       View & Edit

#       pause Edit pitch object, then press "continue" to save and proceed to the
next file

```

```

# determine positions for the final syllables in each of the four parts

select TextGrid 'baseName$'

top1endlabel$ = Get label of interval... 3 2
com1endlabel$ = Get label of interval... 3 4
top2endlabel$ = Get label of interval... 3 6
com2endlabel$ = Get label of interval... 3 8

starttop1end = Get starting point... 3 2
startcom1end = Get starting point... 3 4
starttop2end = Get starting point... 3 6
startcom2end = Get starting point... 3 8

endtop1end = Get end point... 3 2
endcom1end = Get end point... 3 4
endtop2end = Get end point... 3 6
endcom2end = Get end point... 3 8

# Get word label of final word at each part

wordatop1end = Get interval at time... 1 ('starttop1end'+0.0001)
top1endwordlabel$ = Get label of interval... 1 'wordatop1end'

wordatcom1end = Get interval at time... 1 ('startcom1end'+0.0001)
com1endwordlabel$ = Get label of interval... 1 'wordatcom1end'

wordatop2end = Get interval at time... 1 ('starttop2end'+0.0001)
top2endwordlabel$ = Get label of interval... 1 'wordatop2end'

wordatcom2end = Get interval at time... 1 'startcom2end'+0.0001
com2endwordlabel$ = Get label of interval... 1 'wordatcom2end'

# determine positions and labels for the highest and lowest annotated points

bottomtierlabel$ = Get label of interval... 4 2

if bottomtierlabel$ <> ""
    firstextremelabel$ = Get label of interval... 4 2
    startfirstextreme = Get starting point... 4 2
    endfirstextreme = Get end point... 4 2

    secondextremelabel$ = Get label of interval... 4 4
    startsecondextreme = Get starting point... 4 4
    endsecondextreme = Get end point... 4 4

endif

if bottomtierlabel$ == ""
    firstextremelabel$ = Get label of interval... 4 3

```

```

startfirstextreme = Get starting point... 4 3
endfirstextreme = Get end point... 4 3

secondextremelabel$ = Get label of interval... 4 5
startsecondextreme = Get starting point... 4 5
endsecondextreme = Get end point... 4 5

endif

# get f0 values for the endpoints of the parts and the extremes

select Pitch 'baseName$'

meanfirstextreme = Get mean... 'startfirstextreme' 'endfirstextreme'
Hertz

tMaxF0firstextreme = Get time of maximum... 'startfirstextreme'
'endfirstextreme' Hertz Parabolic
tMinF0firstextreme = Get time of minimum... 'startfirstextreme'
'endfirstextreme' Hertz Parabolic

f0maxfirstextreme = Get value at time... 'tMaxF0firstextreme' Hertz
Linear
f0minfirstextreme = Get value at time... 'tMinF0firstextreme' Hertz
Linear

meansecondextreme = Get mean... 'startsecondextreme' 'endsecondextreme'
Hertz

tMaxF0secondextreme = Get time of maximum... 'startsecondextreme'
'endsecondextreme' Hertz Parabolic
tMinF0secondextreme = Get time of minimum... 'startsecondextreme'
'endsecondextreme' Hertz Parabolic

f0maxsecondextreme = Get value at time... 'tMaxF0secondextreme' Hertz
Linear
f0minsecondextreme = Get value at time... 'tMinF0secondextreme' Hertz
Linear

if firstextremelabel$ == "H" and secondextremelabel$ == "L"
    utterancemax = 'f0maxfirstextreme'
    utterancemin = 'f0minsecondextreme'
    posutterancemax = 'tMaxF0firstextreme'
    posutterancemin = 'tMinF0secondextreme'
endif

if firstextremelabel$ == "L" and secondextremelabel$ == "H"
    utterancemax = 'f0maxsecondextreme'
    utterancemin = 'f0minfirstextreme'
    posutterancemax = 'tMaxF0secondextreme'

```

```

        posutterancemin = 'tMinF0firstextreme'
    endif

    meantop1end = Get mean... 'starttop1end' 'endtop1end' Hertz

    tMaxF0top1end = Get time of maximum... 'starttop1end' 'endtop1end' Hertz
Parabolic
    tMinF0top1end = Get time of minimum... 'starttop1end' 'endtop1end' Hertz
Parabolic

    f0maxtop1end = Get value at time... 'tMaxF0top1end' Hertz Linear
    f0mintop1end = Get value at time... 'tMinF0top1end' Hertz Linear

    meancom1end = Get mean... 'startcom1end' 'endcom1end' Hertz

    tMaxF0com1end = Get time of maximum... 'startcom1end' 'endcom1end' Hertz
Parabolic
    tMinF0com1end = Get time of minimum... 'startcom1end' 'endcom1end' Hertz
Parabolic

    f0maxcom1end = Get value at time... 'tMaxF0com1end' Hertz Linear
    f0mincom1end = Get value at time... 'tMinF0com1end' Hertz Linear

    meantop2end = Get mean... 'starttop2end' 'endtop2end' Hertz

    tMaxF0top2end = Get time of maximum... 'starttop2end' 'endtop2end' Hertz
Parabolic
    tMinF0top2end = Get time of minimum... 'starttop2end' 'endtop2end' Hertz
Parabolic

    f0maxtop2end = Get value at time... 'tMaxF0top2end' Hertz Linear
    f0mintop2end = Get value at time... 'tMinF0top2end' Hertz Linear

    meancom2end = Get mean... 'startcom2end' 'endcom2end' Hertz

    tMaxF0com2end = Get time of maximum... 'startcom2end' 'endcom2end' Hertz
Parabolic
    tMinF0com2end = Get time of minimum... 'startcom2end' 'endcom2end' Hertz
Parabolic

    f0maxcom2end = Get value at time... 'tMaxF0com2end' Hertz Linear
    f0mincom2end = Get value at time... 'tMinF0com2end' Hertz Linear

    transformedmeantop1end = ('meantop1end'-'utterancemin')/('utterancemax'-
'utterancemin')
    transformedmeancom1end = ('meancom1end'-'utterancemin')/('utterancemax'-
'utterancemin')
    transformedmeantop2end = ('meantop2end'-'utterancemin')/('utterancemax'-
'utterancemin')
    transformedmeancom2end = ('meancom2end'-'utterancemin')/('utterancemax'-
'utterancemin')

```

```

transformedmaxtop1end = ('f0maxtop1end'-'utterancemin')/('utterancemax'-
'utterancemin')
transformedmaxcom1end = ('f0maxcom1end'-'utterancemin')/('utterancemax'-
'utterancemin')
transformedmaxtop2end = ('f0maxtop2end'-'utterancemin')/('utterancemax'-
'utterancemin')
transformedmaxcom2end = ('f0maxcom2end'-'utterancemin')/('utterancemax'-
'utterancemin')
transformedmintop1end = ('f0mintop1end'-'utterancemin')/('utterancemax'-
'utterancemin')
transformedmincom1end = ('f0mincom1end'-'utterancemin')/('utterancemax'-
'utterancemin')
transformedmintop2end = ('f0mintop2end'-'utterancemin')/('utterancemax'-
'utterancemin')
transformedmincom2end = ('f0mincom2end'-'utterancemin')/('utterancemax'-
'utterancemin')

```

Go through each individual accented syllable

```

for a from 1 to naccsyltier
  select TextGrid 'baseName$'
  syllabel$ = Get label of interval... 2 'a'

  if 'a' = 1
    counter = 0
  endif

  if syllabel$ <> ""
    startsyl = Get starting point... 2 'a'
    endsyl = Get end point... 2 'a'
    lengthsyl = (endsyl - startsyl)*1000

    counter = 'counter'+1
  endif
endfor

```

Get label of word from which the accented syllable comes

```

wordatsyl = Get interval at time... 1 'startsyl'+0.0001
wordlabel$ = Get label of interval... 1 'wordatsyl'

```

Get label of which part and word class accented word belongs to

```

if syllabel$ == "T1N1" or syllabel$ == "T1A1" or
syllabel$ == "T1P1"
  sylpartlabel$ = "topic1"
endif

if syllabel$ == "C1Aux1" or syllabel$ == "C1V1" or
syllabel$ == "C1N1" or syllabel$ == "C1A1" or syllabel$ == "C1P1" or syllabel$ ==
"C1Art1" or syllabel$ == "C1Aux2" or syllabel$ == "C1V2" or syllabel$ == "C1N2" or
syllabel$ == "C1A2" or syllabel$ == "C1P2" or syllabel$ == "C1Art2"

```

```

        sylpartlabel$ = "comment1"
    endif

    if syllabel$ == "T2N1" or syllabel$ == "T2A1"
        sylpartlabel$ = "topic2"
    endif

    if syllabel$ == "C2Aux1" or syllabel$ == "C2V1" or
    syllabel$ == "C2N1" or syllabel$ == "C2A1" or syllabel$ == "C2P1" or syllabel$ ==
    "C2Art1" or syllabel$ == "C2Aux2" or syllabel$ == "C2V2" or syllabel$ == "C2N2" or
    syllabel$ == "C2A2" or syllabel$ == "C2P2" or syllabel$ == "C2Art2"

        sylpartlabel$ = "comment2"
    endif

    if syllabel$ == "T1N1" or syllabel$ == "T2N1" or
    syllabel$ == "C1N1" or syllabel$ == "C1N2" or syllabel$ == "C2N1" or syllabel$ ==
    "C2N2"

        sylwordclasslabel$ = "N"
    endif

    if syllabel$ == "T1A1" or syllabel$ == "T2A1" or
    syllabel$ == "C1A1" or syllabel$ == "C1A2" or syllabel$ == "C2A1" or syllabel$ ==
    "C2A2"

        sylwordclasslabel$ = "A"
    endif

    if syllabel$ == "T1V1" or syllabel$ == "T2V1" or
    syllabel$ == "C1V1" or syllabel$ == "C1V2" or syllabel$ == "C2V1" or syllabel$ ==
    "C2V2"

        sylwordclasslabel$ = "V"
    endif

    if syllabel$ == "T1Aux1" or syllabel$ == "T2Aux1"
    or syllabel$ == "C1Aux1" or syllabel$ == "C1Aux2" or syllabel$ == "C2Aux1" or
    syllabel$ == "C2Aux2"

        sylwordclasslabel$ = "Aux"
    endif

    if syllabel$ == "T1P1" or syllabel$ == "T2P1" or
    syllabel$ == "C1P1" or syllabel$ == "C1P2" or syllabel$ == "C2P1" or syllabel$ ==
    "C2P2"

        sylwordclasslabel$ = "P"
    endif

    if syllabel$ == "C1Art1" or syllabel$ == "C1Art2" or
    syllabel$ == "C2Art1" or syllabel$ == "C2Art2"
        sylwordclasslabel$ = "Art"
    endif

```

```

# Get duration of word

startword = Get starting point... 1 'wordatsyl'
endword = Get end point... 1 'wordatsyl'
lengthword = (endword - startword)*1000

# find out if the word is contrasted in the utterance or not

contratsyl = Get interval at time... 5

'startsyl'+0.0001
    contrlabel$ = Get label of interval... 5 'contratsyl'
    if contrlabel$ <> ""
        contrast$ = "yes"
    else
        contrast$ = "no"
    endif

# Find out what's before the accented syl to determine minimum points

if 'startword' = 'startsyl'
    pretonic = Get interval at time... 1
'startword'-0.0001
    pretoniclabel$ = Get label of interval... 1
'pretonic'

    if pretoniclabel$ <> ""
        firstpretonicfifth = 'startsyl'-0.15
        secondpretonicfifth =
'startsyl'-(0.15-0.15/5)
        thirdpretonicfifth =
'startsyl'-(0.15-2*0.15/5)
        fourthpretonicfifth =
'startsyl'-(0.15-3*0.15/5)
        fifthpretonicfifth =
'startsyl'-(0.15-4*0.15/5)
    endif

endif

if 'startword' < 'startsyl'
    firstpretonicfifth = 'startword'
    secondpretonicfifth =
'startword'+('startsyl'-'startword')/5
    thirdpretonicfifth =
'startword'+2*(('startsyl'-'startword')/5)
    fourthpretonicfifth =
'startword'+3*(('startsyl'-'startword')/5)
    fifthpretonicfifth =
'startword'+4*(('startsyl'-'startword')/5)
endif

```

```

# move on to pitch object

select Pitch 'baseName$'

meansyl = Get mean... 'startsyl' 'endsyl' Hertz

tMaxF0syl = Get time of maximum... 'startsyl' 'endsyl'
Hertz Parabolic
tMinF0syl = Get time of minimum... 'startsyl' 'endsyl'
Hertz Parabolic

f0maxsyl = Get value at time... 'tMaxF0syl' Hertz
Linear
f0minsyl = Get value at time... 'tMinF0syl' Hertz
Linear

meanfirstpretonicfifth = Get mean...
'firstpretonicfifth' 'secondpretonicfifth' Hertz
meansecondpretonicfifth = Get mean...
'secondpretonicfifth' 'thirdpretonicfifth' Hertz
meanthirdpretonicfifth = Get mean...
'thirdpretonicfifth' 'fourthpretonicfifth' Hertz
meanfourthpretonicfifth = Get mean...
'fourthpretonicfifth' 'fifthpretonicfifth' Hertz
meanfifthpretonicfifth = Get mean...
'fifthpretonicfifth' 'startsyl' Hertz

transformedmeansyl = ('meansyl'-'utterancemin')/
('utterancemax'-'utterancemin')
transformedmaxsyl = ('f0maxsyl'-'utterancemin')/
('utterancemax'-'utterancemin')
transformedminsyl = ('f0minsyl'-'utterancemin')/
('utterancemax'-'utterancemin')
transformedmeanfirstpretonicfifth =
('meanfirstpretonicfifth'-'utterancemin')/('utterancemax'-'utterancemin')
transformedmeansecondpretonicfifth =
('meansecondpretonicfifth'-'utterancemin')/('utterancemax'-'utterancemin')
transformedmeanthirdpretonicfifth =
('meanthirdpretonicfifth'-'utterancemin')/('utterancemax'-'utterancemin')
transformedmeanfourthpretonicfifth =
('meanfourthpretonicfifth'-'utterancemin')/('utterancemax'-'utterancemin')
transformedmeanfifthpretonicfifth =
('meanfifthpretonicfifth'-'utterancemin')/('utterancemax'-'utterancemin')

# save edited pitch object

Save as text file: "'directory$'\baseName$'.Pitch"

```

Append values in the TXT file

```

select TextGrid 'baseName$'

fileappend "'directory$'/results.txt"
'baseName$' 'tab$' 'wordlabel$' 'tab$'
... 'naccsyl$' 'tab$'
... 'startutterance$' 'tab$' 'endutterance$' 'tab$'
... 'lengthutterance$' 'tab$' 'syllabel$' 'tab$' 'contrast$'
'tab$' 'counter$' 'tab$' 'sylpartlabel$' 'tab$'
'sylwordclasslabel$' 'tab$'
... 'startsyl$' 'tab$' 'endsyl$' 'tab$' 'lengthsyl$' 'tab$'
... 'meansyl$' 'tab$' 'tMaxF0syl$' 'tab$'
... 'tMinF0syl$' 'tab$' 'f0maxsyl$' 'tab$' 'f0minsyl$' 'tab$'
... 'meanfirstpretonicfifth$' 'tab$'
'meansecondpretonicfifth$' 'tab$'
... 'meanthirdpretonicfifth$' 'tab$'
'meanfourthpretonicfifth$' 'tab$'
... 'meanfifthpretonicfifth$' 'tab$'
'transformedmeansyl$' 'tab$'
... 'transformedmaxsyl$' 'tab$' 'transformedminsyl$' 'tab$'
... 'transformedmeanfirstpretonicfifth$' 'tab$'
'transformedmeansecondpretonicfifth$' 'tab$'
... 'transformedmeanthirdpretonicfifth$' 'tab$'
'transformedmeanfourthpretonicfifth$' 'tab$'
... 'transformedmeanfifthpretonicfifth$' 'tab$'
'startword$' 'tab$'
... 'endword$' 'tab$' 'lengthword$' 'tab$'
... 'firstextremelabel$' 'tab$' 'secondextremelabel$'
'tab$'
... 'utterancemax$' 'tab$' 'utterancemin$' 'tab$'
... 'posutterancemax$' 'tab$' 'posutterancemin$' 'tab$'
... 'top1endwordlabel$' 'tab$' 'starttop1end$'
'tab$' 'endtop1end$' 'tab$'
... 'meantop1end$' 'tab$' 'f0maxtop1end$' 'tab$'
'tMaxF0top1end$' 'tab$'
... 'f0mintop1end$' 'tab$' 'tMinF0top1end$' 'tab$'
... 'transformedmeantop1end$' 'tab$'
'transformedmaxtop1end$' 'tab$' 'transformedmintop1end$' 'tab$'
... 'com1endwordlabel$' 'tab$' 'startcom1end$' 'tab$'
'endcom1end$' 'tab$'
... 'meancom1end$' 'tab$' 'f0maxcom1end$' 'tab$'
'tMaxF0com1end$' 'tab$'
... 'f0mincom1end$' 'tab$' 'tMinF0com1end$' 'tab$'
... 'transformedmeancom1end$' 'tab$'
'transformedmaxcom1end$' 'tab$' 'transformedmincom1end$' 'tab$'
... 'top2endwordlabel$' 'tab$' 'starttop2end$' 'tab$'
'endtop2end$' 'tab$'
... 'meantop2end$' 'tab$' 'f0maxtop2end$' 'tab$'
'tMaxF0top2end$' 'tab$'
... 'f0mintop2end$' 'tab$' 'tMinF0top2end$' 'tab$'

```

```

        ...'transformedmeantop2end''tab$'
'transformedmaxtop2end''tab$''transformedmintop2end'
'tab$'
        ...'com2endwordlabel$''tab$''startcom2end''tab$'
'endcom2end''tab$'
        ...'meancom2end''tab$''f0maxcom2end''tab$'
'tMaxF0com2end''tab$'
        ...'f0mincom2end''tab$''tMinF0com2end''tab$'
        ...'transformedmeancom2end''tab$'
'transformedmaxcom2end''tab$''transformedmincom2end'
'tab$'
        ...'newline$'

    endif
endfor

# Clean up before going on with next file
    select Sound 'baseName$'
    plus TextGrid 'baseName$'
    plus Pitch 'baseName$'
    Remove

endfor

# Final clean up
select Strings list
Remove
clearinfo
print All files done!

```

Script used in section 6.1.6

```
#####
### intonation_slopes.praat
###
### Timo Buchholz
### timobuch@zedat.fu-berlin.de
### March 2018
###
###
### Praat 5.3.56
#####
form Select directories (without final slash)
    comment Where are the WAV files kept?
    sentence wav_dir C:\User\Folder
    comment Where are the TextGrid files kept?
    sentence txt_dir C:\User\Folder
    comment Where should the results file be kept?
    sentence directory C:\User\Folder
    comment Where are the pitch files kept?
    sentence pitch_dir C:\User\Folder
    comment What is the name of the first (main) speaker?
    sentence speakerOne XU33
    comment Which is the tier with the syllables when the main speaker is
speaking?
    integer speakersyltier 4
    comment Which is the tier with the word labels?
    integer wordtier 5
    comment Which language
    sentence language Quechua
    comment Which type of utterance
    sentence typeutterance pos_resp
endform

# Create TXT file with header
filedelete 'directory$/results.txt
header_row$ = "Word.label" + tab$ + "File" + tab$ + "Speaker.name" + tab$ +
... "language" + tab$ + "type.utterance" + tab$ + "number.words.utterance" + tab$
+
... "start.time.utterance" + tab$ + "end.time.utterance" + tab$ +
... "length.utterance" + tab$ + "number.syls.word" + tab$ + "position" + tab$ +
... "initial.slope" + tab$ + "final.slope" + tab$ +
... "start.time.word" + tab$ + "end.time.word" + tab$ +
... "length.word" + tab$ +
... "initial.pitchrange" + tab$ + "final.pitchrange" + tab$ +
... "initial.tone.distance" + tab$ + "final.tone.distance" + tab$ + "initial.Max"
+ tab$ + "final.Max" + tab$ +
... "initial.Min" + tab$ + "final.Min" + tab$ + "initial.pos.Max" + tab$ + "final.
pos.Max" + tab$ + "initial.pos.Min" + tab$ + "final.pos.Min" + tab$ +
... "firstsyluttmean" + tab$ + "lastsyluttmean" + tab$ +
```

```

... "meanF0.firstsyl" + tab$ + "meanF0.secondsyl" + tab$ + "meanF0.penult" + tab$
+ "meanF0.finalsyl" + tab$ +
... "distance.init.max.from.end.of.firstsyl" + tab$ + "distance.init.min.from.end.
of.firstsyl" + tab$ + "distance.final.max.from.end.of.penult" + tab$ + "distance.
final.min.from.end.of.penult" + tab$ +
... "start.firstsyl" + tab$ + "end.firstsyl" + tab$ + "end.secondsyl" + tab$ +
"start.antepenult" + tab$ + "start.penult" + tab$ + "end.penult" + tab$ + "end.
finalsyl" + tab$ +
... "length.firsttwosyls" + tab$ + "length.lasttwosyls" + tab$ +
... "initial.peak.pos" + tab$ + "initial.low.pos" + tab$ + "final.peak.pos" + tab$
+ "final.low.pos" + tab$ + "last.syl.in.word.voiceless" + tab$ +
... newline$
header_row$ > 'directory'/results.txt

```

#Check whether there are pitch files already that have been used and corrected manually before WARNING: You must have one pitch file per each wav file for this to work. If you don't, the script will overwrite your existing pitch files
List all pitch files

```

Create Strings as file list... list 'pitch_dir$'/*.Pitch
numberOfPitchfiles = Get number of strings

```

```

# List all WAV files
Create Strings as file list... list 'wav_dir$'/*.wav
numberOfFiles = Get number of strings

```

Loop that goes through all files

```

for ifile to numberOfFiles
  select Strings list
  fileName$ = Get string... ifile
  baseName$ = fileName$ - ".wav"
  # Read in the Sound files with that base name
  Read from file... 'wav_dir$'/'baseName$'.wav
  Read from file... 'txt_dir$'/'baseName$'.TextGrid

  if 'numberOfPitchfiles' = 'numberOfFiles'

    Read from file... 'txt_dir$'/'baseName$'.Pitch
  else

# # Create Pitch object
    select Sound 'baseName$'
    To Pitch (ac)... 0.005 75 15 no 0.03 0.45 0.01 0.35 0.30 600
  endif

# Select the individual words

  select TextGrid 'baseName$'

```

Determine the number of non-empty intervals on the word tier, i.e. the number of words in the utterance

```
nwordintervaltier = Get number of intervals... 'wordtier'
nemptyintervalswordtier = Count intervals where: 'wordtier', "is equal
to", ""
nwords = 'nwordintervaltier' - 'nemptyintervalswordtier'
```

Get start and end times for utterance (including pauses)

```
startutterance = Get starting point... 'wordtier' 2
endutterance = Get end point... 'wordtier' 'nwordintervaltier'-1
lengthutterance = (endutterance - startutterance)*1000

startfile = Get starting point... 'wordtier' 1

firstsyl = Get interval at time... 'speakersyltier'
'startutterance'+0.0001
lastsyl = Get interval at time... 'speakersyltier' 'endutterance'-0.0001
firstsyluttend = Get end point... 'speakersyltier' 'firstsyl'
lastsylbegin = Get start point... 'speakersyltier' 'lastsyl'
```

```
select Pitch 'baseName$'
```

```
View & Edit
```

pause Edit pitch object, then press "continue" to save and proceed to the next file

```
select TextGrid 'baseName$'
```

Go through each individual word

```
for a from 1 to nwordintervaltier
  select TextGrid 'baseName$'
  wordlabel$ = Get label of interval... 'wordtier' 'a'

  if wordlabel$ <> ""
    startword = Get starting point... 'wordtier' 'a'
    endword = Get end point... 'wordtier' 'a'
    lengthword = (endword - startword)*1000
```

Get number of syllables on the word

```
syntervalstartword = Get interval at time...
'speakersyltier' 'startword'+0.0001
syntervalendword = Get interval at time...
'speakersyltier' 'endword'-0.0001
numbersyls = 'syntervalendword' -
'syntervalstartword'+1
```

```

                                firstsylwordend = Get end point... 'speakersyltier'
'sylintervalstartword'
                                secondsylend = Get end point... 'speakersyltier'
'sylintervalstartword'+1
                                penultbegin = Get start point... 'speakersyltier'
'sylintervalendword'-1
                                penultend = Get end point... 'speakersyltier'
'sylintervalendword'-1

                                if 'sylintervalendword'-2 >= 1
                                    antepenultbegin = Get start point...
'speakersyltier' 'sylintervalendword'-2
                                endif

                                lengthfirstsecondsyl = 'secondsylend'-'startword'
                                lengthpenultfinalsyl = 'endword'-'penultbegin'

# Find out whether the word is initial medial or final

                                leftwordinterval = Get interval at time... 'wordtier'
'startword'-0.0001
                                rightwordinterval = Get interval at time... 'wordtier'
'endword'+0.0001
                                leftwordlabel$ = Get label of interval... 'wordtier'
'sylintervalendword'-1
                                rightwordlabel$ = Get label of interval... 'wordtier'
'rightwordinterval'

                                if leftwordlabel$ <> "" and rightwordlabel$ <> ""
                                    wordposition$ = "medial"
                                endif

                                if leftwordlabel$ <> "" and rightwordlabel$ = ""
                                    wordposition$ = "final"
                                endif

                                if leftwordlabel$ = "" and rightwordlabel$ <> ""
                                    wordposition$ = "initial"
                                endif

                                if leftwordlabel$ = "" and rightwordlabel$ = ""
                                    wordposition$ = "standalone"
                                endif

# Move on to pitch object

                                select Pitch 'baseName$'

                                meanF0_firstsyl = Get mean... ('startutterance'-
'startfile') ('firstsylvuttend'-'startfile') Hertz

```

```

meanF0_lastsyl = Get mean... ('lastsylbegin'-
'startfile') ('endutterance'- 'startfile') Hertz

# test whether the whole word is voiceless and then proceed accordingly

testmeanF0_word = Get mean... ('startword'- 'startfile')
('endword'- 'startfile') Hertz
testmeanF0_wordstring$ = "'testmeanF0_word'"

#THIS IS THE !!!OPTIONAL!!! IF-CONDITION CHECKING WHETHER THE WORD HAS ANY VOICING
AT ALL - IT'S NOT TABSPACED THE WAY IT SHOULD BE BECAUSE THAT WOULD HAVE MEANT
TABSPACING EVERYTHING ELSE AGAIN BUT IT IS SURROUNDED BY THIS WARNING TO MAKE YOU
AWARE
#
if testmeanF0_wordstring$ <> "--undefined--"
#THIS IS THE !!!OPTIONAL!!! IF-CONDITION CHECKING WHETHER THE WORD HAS ANY VOICING
AT ALL - IT'S NOT TABSPACED THE WAY IT SHOULD BE BECAUSE THAT WOULD HAVE MEANT
TABSPACING EVERYTHING ELSE AGAIN BUT IT IS SURROUNDED BY THIS WARNING TO MAKE YOU
AWARE

# test whether last syllable is voiceless and then proceed accordingly

testlastsylF0 = Get mean... 'penultend'- 'startfile'
'endword'- 'startfile' Hertz
testlastsylF0string$ = "'testlastsylF0'"

if testlastsylF0string$ = "--undefined--"

    reducednumbersyls = 'numbersyls'-1
else
    reducednumbersyls = 'numbersyls'

endif

if 'reducednumbersyls' = 'numbersyls'

    if 'numbersyls' < 2

        tMaxF0init = Get time of maximum...
        'startword'- 'startfile' 'endword'- 'startfile' Hertz Parabolic

        tMinF0init = Get time of minimum...
        'startword'- 'startfile' 'endword'- 'startfile' Hertz Parabolic

        f0maxsylininit = Get value at time...
        'tMaxF0init' Hertz Linear

        f0minsylininit = Get value at time...
        'tMinF0init' Hertz Linear
    
```

```

maxdistfromendoffirstsyl =
'tMaxF0init' + 'startfile' - 'firstsylwordend'
mindistfromendoffirstsyl =
'tMinF0init' + 'startfile' -
'firstsylwordend'

maxdistfromendofpenult =
'maxdistfromendoffirstsyl'
mindistfromendofpenult =
'mindistfromendoffirstsyl'

initialpitchrange =
'f0maxsylnit'-'f0minsylnit'
initialtonedistance = ('tMaxF0init' -
'tMinF0init')*1000

initialslope = 'initialpitchrange' /
finalslope = 'initialpitchrange' /

finalpitchrange = 'initialpitchrange'
finaltonedistance =
'initialtonedistance'

finalpeaksyl$ = "'NA'"
finalallowsyl$ = "'NA'"
initialpeaksyl$ = "'NA'"
initialallowsyl$ = "'NA'"

tMaxF0initreal = 'tMaxF0init'+
startfile'
tMinF0initreal = 'tMinF0init'+
startfile'

tMaxF0finreal = 'tMaxF0initreal'
tMinF0finreal = 'tMinF0initreal'

f0maxsylfin = 'f0maxsylnit'
f0minsylfin = 'f0minsylnit'

meanF0firstsyl = Get mean...
'startword'-'startfile' 'firstsylwordend'-'startfile' Hertz

"meanF0firstsyl"

meanF0secondsylstring$ = "'NA'"
meanF0penultstring$ = "'NA'"
meanF0finalsylstring$ = "'NA'"

```

```

    "initialslope"

    "initialpitchrange"

    "finalpitchrange"

    "initialtonedistance"

    "finaltonedistance"

    "f0maxsylnit"

    "f0minsylnit"

    "f0minsylnit"

    "tMaxF0initreal"

    "tMinF0initreal"

    "tMaxF0finreal"

    "tMinF0finreal"

    initialslopestring$ =

    finalslopestring$ = "finalslope"
    initialpitchrangestring$ =

    finalpitchrangestring$ =

    initialtonedistancestring$ =

    finaltonedistancestring$ =

    f0maxsylnitstring$ =

    f0minsylnitstring$ =

    f0maxsylnitstring$ = "f0maxsylnit"
    f0maxsylnitstring$ = "f0maxsylnit"
    f0minsylnitstring$ =

    f0minsylnitstring$ = "f0minsylnit"
    tMaxF0initrealstring$ =

    tMinF0initrealstring$ =

    tMaxF0finrealstring$ =

    tMinF0finrealstring$ =

    secondsylendstring$ = "NA"
    antepenultbeginstring$ = "NA"
    penultbeginstring$ = "NA"
    penultendstring$ = "NA"

    maxdistfromendoffirstsylstring$ =

    mindistfromendoffirstsylstring$ =

    maxdistfromendofpenultstring$ =

    mindistfromendofpenultstring$ =

endif

if 'numbersyls' = 2

    tMaxF0init = Get time of maximum...
    'startword'-'startfile' 'secondsylend'-'startfile' Hertz Parabolic

```

```

tMinF0init = Get time of minimum...
'startword'-'startfile' 'secondsynd'-'startfile' Hertz Parabolic

f0maxsylnit = Get value at time...
'tMaxF0init' Hertz Linear

f0minsylnit = Get value at time...
'tMinF0init' Hertz Linear

if 'tMaxF0init' <=
('secondsynd'-'startfile') and 'tMaxF0init' > ('firstsyndwordend'-'startfile')
    initialpeaksyl$ =
"second"
endif

if 'tMaxF0init' <= ('first-
syndwordend'-'startfile') and 'tMaxF0init' >= ('startword'-'startfile')
    initialpeaksyl$ =
"first"
endif

if 'tMinF0init' <= ('sec-
ondsynd'-'startfile') and 'tMinF0init' > ('firstsyndwordend'-'startfile')
    initialallowsyl$ =
"second"
endif

if 'tMinF0init' <= ('first-
syndwordend'-'startfile') and 'tMinF0init' >= ('startword' - 'startfile')
    initialallowsyl$ =
"first"
endif

maxdistfromendoffirstsyl =
'tMaxF0init' + 'startfile' - 'firstsyndwordend'
mindistfromendoffirstsyl =
'tMinF0init' + 'startfile' - 'firstsyndwordend'

initialpitchrange =
'f0maxsylnit'-'f0minsylnit'

initialtonedistance = ('tMaxF0init' -
'tMinF0init')*1000

finalpeaksyl$ = "initialpeaksyl$"
finalallowsyl$ = "initialallowsyl$"

initialslope = 'initialpitchrange' /
'initialtonedistance'

tMaxF0fin = Get time of maximum...
'penultbegin'-'startfile' 'endword'-'startfile' Hertz Parabolic

```

```

tMinF0fin = Get time of minimum...
'penultbegin'-'startfile' 'endword'-'startfile' Hertz Parabolic

f0maxsylvfin = Get value at time...
'tMaxF0fin' Hertz Linear
f0minsylvfin = Get value at time...
'tMinF0fin' Hertz Linear

finalpitchrange =
'f0maxsylvfin'-'f0minsylvfin'
finaltonedistance = ('tMaxF0fin' -
'tMinF0fin')*1000

finalslope = 'finalpitchrange' /
'finaltonedistance'

tMaxF0initreal = 'tMaxF0init'+
'tMinF0initreal = 'tMinF0init'+
'tMaxF0finreal = 'tMaxF0fin'+
'tMinF0finreal = 'tMinF0fin'+

meanF0firstsylv = Get mean...
'startword'-'startfile' 'firstsylvwordend'-'startfile' Hertz
meanF0finalsylv = Get mean...
'penultend'-'startfile' 'endword'-'startfile' Hertz

maxdistfromendoffirstsylv =
'maxdistfromendoffirstsylv'
mindistfromendoffirstsylv =
'mindistfromendoffirstsylv'

meanF0firstsylvstring$ =
meanF0secondsylvstring$ = "'NA'"
meanF0penultstring$ = "'NA'"
meanF0finalsylvstring$ =

initialslopestring$ =
finalslopestring$ = "'finalslope'"
initialpitchrangestring$ =
finalpitchrangestring$ =
initialtonedistancestring$ =

```

```

    "finaltonedistance"
    "f0maxsylnit"
    "f0minsylnit"
    "f0minsylnit"
    "f0minsylnit"
    "tMaxF0initreal"
    "tMinF0initreal"
    "tMaxF0finreal"
    "tMinF0finreal"

    "secondsylend"

    "maxdistfromendoffirstsyl"
    "mindistfromendoffirstsyl"
    "maxdistfromendofpenult"
    "mindistfromendofpenult"

    endif

    if 'numbersyls' > 2

        tMaxF0init = Get time of maximum...
        'startword'-'startfile' 'secondsylend'-'startfile' Hertz Parabolic

        tMinF0init = Get time of minimum...
        'startword'-'startfile' 'secondsylend'-'startfile' Hertz Parabolic

        f0maxsylnit = Get value at time...
        f0minsylnit = Get value at time...

```

```

                                if 'tMaxF0init' <=
('secondsylend'-'startfile') and 'tMaxF0init' > ('firstsylwordend'-'startfile')
                                initialpeaksyl$ =
"second"
                                endif
                                if 'tMaxF0init' <=
('firstsylwordend'-'startfile') and 'tMaxF0init' >= ('startword'-'startfile')
                                initialpeaksyl$ =
"first"
                                endif
                                if 'tMinF0init' <=
('secondsylend'-'startfile') and 'tMinF0init' > ('firstsylwordend'-'startfile')
                                initialallowsyl$ =
"second"
                                endif
                                if 'tMinF0init' <=
('firstsylwordend'-'startfile') and 'tMinF0init' >= ('startword'-'startfile')
                                initialallowsyl$ =
"first"
                                endif
                                maxdistfromendoffirstsyl =
'tMaxF0init' + 'startfile' - 'firstsylwordend'
                                mindistfromendoffirstsyl =
'tMinF0init' + 'startfile' - 'firstsylwordend'
                                initialpitchrange = 'f0maxsylini'-'
'f0minsylini'
                                initialtonedistance = ('tMaxF0init' -
'tMinF0init')*1000
                                initialslope = 'initialpitchrange' /
'initialtonedistance'
                                tMaxF0fin = Get time of maximum...
'penultbegin'-'startfile' 'endword'-'startfile' Hertz Parabolic
                                tMinF0fin = Get time of minimum...
'penultbegin'-'startfile' 'endword'-'startfile' Hertz Parabolic
                                f0maxsylfin = Get value at time...
'tMaxF0fin' Hertz Linear
                                f0minsylinfin = Get value at time...
'tMinF0fin' Hertz Linear
                                if 'tMaxF0fin' <=
('endword'-'startfile') and 'tMaxF0fin' > ('penultend'-'startfile')

```

```

finalpeaksyl$ =
“final”
endif

if ‘tMaxF0fin’ <=
(‘penultend’-‘startfile’) and ‘tMaxF0fin’ >= (‘penultbegin’-‘startfile’)
finalpeaksyl$ =
“penult”
endif

if ‘tMinF0fin’ <=
(‘endword’-‘startfile’) and ‘tMinF0fin’ > (‘penultend’-‘startfile’)
finalallowsyl$ =
“final”
endif

if ‘tMinF0fin’ <=
(‘penultend’-‘startfile’) and ‘tMinF0fin’ >= (‘penultbegin’ - ‘startfile’)
finalallowsyl$ =
“penult”
endif

maxdistfromendofpenult = ‘tMaxF0fin’
mindistfromendofpenult = ‘tMinF0fin’

+ ‘startfile’ - ‘penultend’
+ ‘startfile’ - ‘penultend’

finalpitchrange = ‘f0maxsylfin’-
‘f0minsylfin’
finaltonedistance = (‘tMaxF0fin’ -
‘tMinF0fin’)*1000

finalslope = ‘finalpitchrange’ /
‘finaltonedistance’

tMaxF0initreal =
‘tMaxF0init’+‘startfile’
tMinF0initreal =
‘tMinF0init’+‘startfile’
tMaxF0finreal =
‘tMaxF0fin’+‘startfile’
tMinF0finreal =
‘tMinF0fin’+‘startfile’

meanF0firstsyl = Get mean...
‘startword’-‘startfile’ ‘firstsylwordend’-‘startfile’ Hertz
meanF0secondsyl = Get mean...
‘firstsylwordend’-‘startfile’ ‘secondsylend’-‘startfile’ Hertz
meanF0penult = Get mean...
‘penultbegin’-‘startfile’ ‘penultend’-‘startfile’ Hertz

```

```

meanF0finalsyl = Get mean...
'penultend'-'startfile' 'endword'-'startfile' Hertz

meanF0firstsylstring$ =
meanF0secondsylstring$ =
meanF0penultstring$ =
meanF0finalsylstring$ =

initialslopestring$ =
finalslopestring$ = "finalslope"
initialpitchrangestring$ =
finalpitchrangestring$ =
initialtonedistancestring$ =
finaltonedistancestring$ =
f0maxsylnitstring$ =
f0minsylnitstring$ =
f0maxsylnitstring$ = "f0maxsylnit"
f0maxsylnitstring$ = "f0maxsylnit"
f0minsylnitstring$ =
f0minsylnitstring$ = "f0minsylnit"
tMaxF0initrealstring$ =
tMinF0initrealstring$ =
tMaxF0finrealstring$ =
tMinF0finrealstring$ =

secondsylendstring$ =
antepenultbeginstring$ =
penultbeginstring$ = "penultbegin"
penultendstring$ = "penultend"

maxdistfromendoffirstsylstring$ =

```

```

mindistfromendoffirstsylstring$ =
mindistfromendoffirstsyl"
maxdistfromendofpenultstring$ =
maxdistfromendofpenult"
mindistfromendofpenultstring$ =
mindistfromendofpenult"

endif

lastsylvoiceless$ = "NO"

endif

if 'reducednumbersyls' = 'numbersyls'-1

if 'reducednumbersyls' < 2

tMaxF0init = Get time of maximum...
'startword'-'startfile' 'firstsylwordend'-'startfile' Hertz Parabolic

tMinF0init = Get time of minimum...
'startword'-'startfile' 'firstsylwordend'-'startfile' Hertz Parabolic

tMaxF0initstring$ = "'tMaxF0init'"
tMinF0initstring$ = "'tMinF0init'"

if tMaxF0initstring$ <>

"--undefined--"

f0maxsylnit = Get value at
time... 'tMaxF0init' Hertz Linear

f0minsylnit = Get value at
time... 'tMinF0init' Hertz Linear

maxdistfromendoffirstsyl =
mindistfromendoffirstsyl =
'tMaxF0init' + 'startfile' - 'firstsylwordend'
'tMinF0init' + 'startfile' - 'firstsylwordend'

maxdistfromendofpenult =
mindistfromendofpenult =
'maxdistfromendoffirstsyl'
'mindistfromendoffirstsyl'

initialpitchrange =
'f0maxsylnit'-'f0minsylnit'

initialtonedistance =
('tMaxF0init' - 'tMinF0init')*1000

initialslope =
'initialpitchrange' / 'initialtonedistance'

```

```
'initialpitchrange' / 'initialtonedistance'
```

```
'initialpitchrange'
```

```
'initialtonedistance'
```

```
'tMaxF0init'+startfile'
```

```
'tMinF0init'+startfile'
```

```
'tMaxF0initreal'
```

```
'tMinF0initreal'
```

```
'startword'-'startfile' 'firstsylwordend'-'startfile'
```

```
"'meanF0firstsyl'"
```

```
"'NA'"
```

```
"'NA'"
```

```
"'initialslope'"
```

```
"'finalslope'"
```

```
"'initialpitchrange'"
```

```
"'finalpitchrange'"
```

```
"'initialtonedistance'"
```

```
"'finaltonedistance'"
```

```
"'f0maxsylnit'"
```

```
"'f0minsylnit'"
```

```
"'f0maxsylvfin'"
```

```
finalslope =
```

```
finalpitchrange =
```

```
finaltonedistance =
```

```
tMaxF0initreal =
```

```
tMinF0initreal =
```

```
tMaxF0finreal =
```

```
tMinF0finreal =
```

```
f0maxsylvfin = 'f0maxsylnit'
```

```
f0minsylvfin = 'f0minsylnit'
```

```
meanF0firstsyl = Get mean...  
Hertz
```

```
meanF0firstsylstring$ =
```

```
meanF0secondsylstring$ =
```

```
meanF0penultstring$ = "'NA'"
```

```
meanF0finalsylvstring$ =
```

```
initialslopestring$ =
```

```
finalslopestring$ =
```

```
initialpitchrangestring$ =
```

```
finalpitchrangestring$ =
```

```
initialtonedistancestring$ =
```

```
finaltonedistancestring$ =
```

```
f0maxsylnitstring$ =
```

```
f0minsylnitstring$ =
```

```
f0maxsylvfinstring$ =
```

```

f0maxsylinstring$ =
f0minsylinstring$ =
f0minsylinstring$ =
tMaxF0initrealstring$ =
tMinF0initrealstring$ =
tMaxF0finrealstring$ =
tMinF0finrealstring$ =

maxdistfromendoffirstsylstring$ = "maxdistfromendoffirstsyl"
mindistfromendoffirstsylstring$ = "mindistfromendoffirstsyl"
maxdistfromendofpenultstring$ = "maxdistfromendofpenult"
mindistfromendofpenultstring$ = "mindistfromendofpenult"

else
    initialslopestring$ = "'NA'"
    finalslopestring$ = "'NA'"
    initialpitchrangestring$ =
    finalpitchrangestring$ =
    initialtonedistancestring$ =
    finaltonedistancestring$ =
    f0maxsylinstring$ = "'NA'"
    f0minsylinstring$ = "'NA'"
    f0maxsylinstring$ = "'NA'"
    f0maxsylinstring$ = "'NA'"
    f0minsylinstring$ = "'NA'"
    f0minsylinstring$ = "'NA'"
    tMaxF0initrealstring$ =
    tMinF0initrealstring$ =
    tMaxF0finrealstring$ =
    tMinF0finrealstring$ =
    meanF0firstsylstring$ =

    "'NA'"
    "'NA'"
    "'NA'"
    "'NA'"
    "'NA'"
    "'NA'"
    "'NA'"

```

```

                                meanF0secondsylstring$ =
                                meanF0penultstring$ = "'NA'"
                                meanF0finalsystring$ =
"'NA'"

maxdistfromendoffirstsystring$ = "'NA'"
mindistfromendoffirstsystring$ = "'NA'"
maxdistfromendofpenultstring$ = "'NA'"
mindistfromendofpenultstring$ = "'NA'"

                                endif

                                finalpeaksyl$ = "'NA'"
                                finalallowsyl$ = "'NA'"
                                initialpeaksyl$ = "'NA'"
                                initialallowsyl$ = "'NA'"

                                secondsylendstring$ = "'NA'"
                                antepenultbeginstring$ = "'NA'"
                                penultbeginstring$ = "'NA'"
                                penultendstring$ = "'NA'"

                                endif

                                if 'reducednumbersyls' = 2

                                tMaxF0init = Get time of maximum...
                                'startword'-'startfile' 'secondsylend'-'startfile' Hertz Parabolic

                                tMinF0init = Get time of minimum...
                                'startword'-'startfile' 'secondsylend'-'startfile' Hertz Parabolic

                                f0maxsylininit = Get value at time...
                                'tMaxF0init' Hertz Linear

                                f0minsylininit = Get value at time...
                                'tMinF0init' Hertz Linear

                                if 'tMaxF0init' <=
                                ('secondsylend'-'startfile') and 'tMaxF0init' > ('firstsywordend'-'startfile')
                                initialpeaksyl$ =
                                "second"

                                endif

                                if 'tMaxF0init' <=
                                ('firstsywordend'-'startfile') and 'tMaxF0init' >= ('startword'-'startfile')
                                initialpeaksyl$ =
                                "first"

```

```

endif

if 'tMinF0init' <=
('secondsylend'-'startfile') and 'tMinF0init' > ('firstsylwordend'-'startfile')
    initialallowsyl$ =
"second"
endif

if 'tMinF0init' <=
('firstsylwordend'-'startfile') and 'tMinF0init' >= ('startword' - 'startfile')
    initialallowsyl$ =
"first"
endif

finalpeaksyl$ = "'initialpeaksyl$'"
finalallowsyl$ = "'initialallowsyl$'"

maxdistfromendoffirstsyl =
'tMaxF0init' + 'startfile' - 'firstsylwordend'
mindistfromendoffirstsyl =
'tMinF0init' + 'startfile' - 'firstsylwordend'

initialpitchrange = 'f0maxsylnit'-
'f0minsylnit'
initialtonedistance = ('tMaxF0init' -
'tMinF0init')*1000

initialslope = 'initialpitchrange' /
'initialtonedistance'

tMaxF0fin = 'tMaxF0init'
tMinF0fin = 'tMinF0init'

f0maxsylfin = Get value at time...
f0minsylfin = Get value at time...

finalpitchrange = 'f0maxsylfin'-
'f0minsylfin'
finaltonedistance = ('tMaxF0fin' -
'tMinF0fin')*1000

finalslope = 'finalpitchrange' /
'finaltonedistance'

tMaxF0initreal =
'tMaxF0init'+ 'startfile'
tMinF0initreal =
'tMinF0init'+ 'startfile'

```

```

'tMaxF0fin'+ 'startfile'
'tMinF0fin'+ 'startfile'

'maxdistfromendoffirstsyl'
'mindistfromendoffirstsyl'

meanF0firstsyl = Get mean...
'startword'-'startfile' 'firstsylwordend'-'startfile' Hertz
meanF0finalsyl = Get mean...
'firstsylwordend'-'startfile' 'secondsylend'-'startfile' Hertz

meanF0firstsylstring$ =
meanF0secondsylstring$ = "'NA'"
meanF0penultstring$ = "'NA'"
meanF0finalsylstring$ =

initialslopestring$ =
finalslopestring$ = "'finalslope'"
initialpitchrangestring$ =
finalpitchrangestring$ =
initialtonedistancestring$ =
finaltonedistancestring$ =
f0maxsylnitstring$ =
f0minsylnitstring$ =
f0maxsylnitstring$ = "'f0maxsylnit'"
f0maxsylnitstring$ = "'f0maxsylnit'"
f0minsylnitstring$ =
f0minsylnitstring$ = "'f0minsylnit'"
f0minsylnitstring$ = "'f0minsylnit'"
tMaxF0initrealstring$ =
tMinF0initrealstring$ =
tMaxF0finrealstring$ =
tMinF0finrealstring$ =

```

```

                                secondsylendstring$ =
“'secondsylend'”
                                antepenultbeginstring$ = “'NA'”
                                penultbeginstring$ = “'NA'”
                                penultendstring$ = “'NA'”

                                maxdistfromendoffirstsylstring$ =
“'maxdistfromendoffirstsyl'”
                                mindistfromendoffirstsylstring$ =
“'mindistfromendoffirstsyl'”
                                maxdistfromendofpenultstring$ =
“'maxdistfromendofpenult'”
                                mindistfromendofpenultstring$ =
“'mindistfromendofpenult'”

                                endif

                                if ‘reducednumbersyls’ > 2

                                    tMaxF0init = Get time of maximum...
‘startword’-‘startfile’ ‘secondsylend’-‘startfile’ Hertz Parabolic

                                    tMinF0init = Get time of minimum...
‘startword’-‘startfile’ ‘secondsylend’-‘startfile’ Hertz Parabolic

                                    f0maxsylnit = Get value at time...
‘tMaxF0init’ Hertz Linear
                                    f0minsylnit = Get value at time...
‘tMinF0init’ Hertz Linear

                                    if ‘tMaxF0init’ <=
(‘secondsylend’-‘startfile’) and ‘tMaxF0init’ > (‘firstsylwordend’-‘startfile’)
                                        initialpeaksyl$ =
“second”
                                    endif

                                    if ‘tMaxF0init’ <=
(‘firstsylwordend’-‘startfile’) and ‘tMaxF0init’ >= (‘startword’-‘startfile’)
                                        initialpeaksyl$ =
“first”
                                    endif

                                    if ‘tMinF0init’ <=
(‘secondsylend’-‘startfile’) and ‘tMinF0init’ > (‘firstsylwordend’-‘startfile’)
                                        initialallowsyl$ =
“second”
                                    endif

                                    if ‘tMinF0init’ <=
(‘firstsylwordend’-‘startfile’) and ‘tMinF0init’ >= (‘startword’ - ‘startfile’)

```



```

'f0minsylfin'
'tMinF0fin')*1000

+ 'startfile' - 'penultbegin'
+ 'startfile' - 'penultbegin'

'finaltonedistance'

'tMaxF0init'+ 'startfile'
'tMinF0init'+ 'startfile'
'tMaxF0fin'+ 'startfile'
'tMinF0fin'+ 'startfile'

'startword'-'startfile' 'firstsylwordend'-'startfile' Hertz
'firstsylwordend'-'startfile' 'secondsylend'-'startfile' Hertz
'antepenultbegin'-'startfile' 'penultbegin'-'startfile' Hertz
'penultbegin'-'startfile' 'penultend'-'startfile' Hertz

" 'meanF0firstsyl' "
" 'meanF0secondsyl' "
" 'meanF0penult' "
" 'meanF0finalsyl' "

" 'initialslope' "

" 'initialpitchrange' "
" 'finalpitchrange' "
" 'initialtonedistance' "
" 'finaltonedistance' "

finalpitchrange = 'f0maxsylfin' -
finaltonedistance = ('tMaxF0fin' -
maxdistfromendofpenult = 'tMaxF0fin'
mindistfromendofpenult = 'tMinF0fin'

finalslope = 'finalpitchrange' /

tMaxF0initreal =
tMinF0initreal =
tMaxF0finreal =
tMinF0finreal =

meanF0firstsyl = Get mean...
meanF0secondsyl = Get mean...
meanF0penult = Get mean...
meanF0finalsyl = Get mean...

meanF0firstsylstring$ =
meanF0secondsylstring$ =
meanF0penultstring$ =
meanF0finalsylstring$ =

initialslopestring$ =
finalslopestring$ = " 'finalslope' "
initialpitchrangestring$ =
finalpitchrangestring$ =
initialtonedistancestring$ =
finaltonedistancestring$ =

```

```

                                f0maxsylnitstring$ =
                                f0minsylnitstring$ =

                                f0maxsylfinstring$ = "'f0maxsylfin'"
                                f0maxsylfinstring$ = "'f0maxsylfin'"
                                f0minsylnitstring$ =

                                f0minsylfinstring$ = "'f0minsylfin'"
                                tMaxF0initrealstring$ =

                                tMinF0initrealstring$ =

                                tMaxF0finrealstring$ =

                                tMinF0finrealstring$ =

                                secondsylenstring$ =

                                antepenultbeginstring$ =

                                penultbeginstring$ = "'penultbegin'"
                                penultendstring$ = "'penultend'"

                                maxdistfromendoffirstsylstring$ =

                                mindistfromendoffirstsylstring$ =

                                maxdistfromendofpenultstring$ =

                                mindistfromendofpenultstring$ =

                                " 'f0maxsylnit'"
                                " 'f0minsylnit'"

                                " 'f0maxsylfin'"
                                " 'f0minsylfin'"

                                " 'f0maxsylnit'"
                                " 'f0minsylnit'"

                                " 'tMaxF0initreal'"
                                " 'tMinF0initreal'"

                                " 'tMaxF0finreal'"
                                " 'tMinF0finreal'"

                                " 'secondsylen'"
                                " 'antepenultbegin'"

                                " 'maxdistfromendoffirstsyl'"
                                " 'mindistfromendoffirstsyl'"

                                " 'maxdistfromendofpenult'"
                                " 'mindistfromendofpenult'"

                                endif

                                lastsylvoiceless$ = "YES"

                                endif

#THIS IS THE !!!OPTIONAL!!! IF-CONDITION CHECKING WHETHER THE WORD HAS ANY VOICING
AT ALL - IT'S NOT TABSPACED THE WAY IT SHOULD BE BECAUSE THAT WOULD HAVE MEANT
TABSPACING EVERYTHING ELSE AGAIN BUT IT IS SURROUNDED BY THIS WARNING TO MAKE YOU
AWARE
#
                                endif
#THIS IS THE !!!OPTIONAL!!! IF-CONDITION CHECKING WHETHER THE WORD HAS ANY VOICING
AT ALL - IT'S NOT TABSPACED THE WAY IT SHOULD BE BECAUSE THAT WOULD HAVE MEANT
TABSPACING EVERYTHING ELSE AGAIN BUT IT IS SURROUNDED BY THIS WARNING TO MAKE YOU
AWARE

```

```

#                                     print "initialslope" 'initialslope',
"finalslope" 'finalslope', "initialpitchchange" 'initialpitchchange', "initialtone-
distance" 'initialtonedistance', "finalpitchchange" 'finalpitchchange', "finaltone-
distance" 'finaltonedistance'

# save edited pitch object

Save as text file: "directory$\baseName$.Pitch"

# Append values in the TXT file

select TextGrid 'baseName$'

fileappend "directory$/results.txt" 'wordlabel$' tab$
'baseName$' tab$ 'speakerOne$' tab$
... 'language$' tab$ 'typeutter-
ance$' tab$ 'nwords' tab$
... 'startutterance' tab$ 'endutterance' tab$
... 'lengthutterance' tab$ 'numbersyls' tab$
... 'wordposition$' tab$ 'initialslopestring$' tab$
... 'finalslopestring$' tab$ 'startword' tab$
... 'endword' tab$ 'lengthword' tab$
... 'initialpitchrangestring$' tab$ 'finalpitchrange-
string$' tab$
... 'initialtonedistancestring$' tab$
'finaltonedistancestring$' tab$ 'f0maxsylnitstring$' tab$
... 'f0maxsylfinstring$' tab$ 'f0minsylnit-
string$' tab$
... 'f0minsylnitstring$' tab$ 'tMaxF0initreal-
string$' tab$
... 'tMaxF0finrealstring$' tab$ 'tMinF0initreal-
string$' tab$
... 'tMinF0finrealstring$' tab$
... 'meanF0_firstsyl' tab$ 'meanF0_lastsyl' tab$
... 'meanF0firstsylvstring$' tab$ 'meanF0secondsyl-
string$' tab$
... 'meanF0penultstring$' tab$ 'meanF0finalsylv-
string$' tab$
... 'maxdistfromendoffirstsylvstring$' tab$
'mindistfromendoffirstsylvstring$' tab$ 'maxdistfromendofpenultstring$' tab$
'mindistfromendofpenultstring$' tab$
... 'startword' tab$ 'firstsylvwordend' tab$
'secondsylenstring$' tab$ 'antepenultbeginstring$' tab$ 'penultbeginstring$'
tab$ 'penultendstring$' tab$ 'endword' tab$
... 'lengthfirstsecondsyl' tab$ 'lengthpenultfinal-
sylv' tab$ 'initialpeaksylv' tab$
... 'initialallowsylv' tab$ 'finalpeaksylv' tab$
'finalallowsylv' tab$ 'lastsylvvoiceless$' tab$
... 'newline$'

```

```
                endif
            endfor

# Clean up before going on with next file
    select Sound 'baseName$'
    plus TextGrid 'baseName$'
    plus Pitch 'baseName$'
    Remove

endfor

# Final clean up
select Strings list
Remove
clearinfo
print All files done!
```

