QualCoder

QualCoder is free software for qualitative data analysis

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1 What is QualCoder

QualCoder is free, open source software for qualitative data analysis.

With QualCoder you can code text and images, write journal notes and memos. You can categorise codes into a tree-like hierarchical categorisation scheme. Coding for audio and video can be performed and requires the VLC media player.

Reports can be generated for text coding and for coder comparison using the Cohen's Kappa statistic. A graph displaying codes and categories can be generated to visualise the coding hierarchy. Most reports can be exported at html, open document text, csv or plain text files.

QualCoder is written in python 3 using Qt5 for the graphical interface. A Sqlite database is used to store the coding data.

The most current QualCoder is available from https://github.com/ccbogel/QualCoder.

Releases are available from: https://github.com/ccbogel/QualCoder/releases These contain source code and Linux Debian packages (you still need to install some modules using the terminal).

There is also a wordpress site at https://qualcoder.wordpress.com/.

1.1 Why use QualCoder?

Firstly, QualCoder is free. You do not need to pay for a commercial software license. QualCoder is easy to use and contains the core functionalities required for qualitative analysis. You use Linux. QualCoder has been developed on Linux and also works on Windows. There are many Free Open Source Software (FOSS) supporters who are willing to use and support FLOSS development.

The minimum recommended screen size is 1024 x 600 pixels.

2 Downloading files and dependencies

Download the latest QualCoder from GitHub: https://github.com/ccbogel/QualCoder. Unzip the folder. The main program code is in the *QualCoder* folder. The Examples folder contains some example files which can be loaded into a test QualCoder project. There are an install.sh and a QualCoder.desktop file which are used to create a Linux Launcher.

2.1 Preparatory Downloads

2.1.1 Microsoft Windows

You will need to download and install Python 3. Then install PyQt5, lxml and Pillow modules. A Python 3 release can be obtained here: https://www.python.org/downloads/windows/. Finally, you need to have the VLC media player installed. You can get this from the Windows Store or from their website: https://www.videolan.org/vlc/download-windows.html Please ensure that the Python and VLC downloads are in the same architecture – that is – 32 bit or 64 bit for both. Otherwise QualCoder will not work.

Once a Python 3 release is installed you should be able to install the required modules using the following command in the Windows Command prompt (The prompt is under Windows System):

```
python -m pip install pyqt5 lxml Pillow ebooklib ply chardet pdfminer.six
openpyxl
```

Sometimes there are problems recognising the audio/video VLC library file: libvlc.dll
Some solutions are to add the path of the file to PATH here:
https://stackoverflow.com/questions/42045887/python-vlc-install-problems?noredirect=1

2.1.2 Debian/Ubuntu Linux

I have created QualCoder.deb packages for easy install on Debian/Ubuntu systems. The Debians for Linux instillation are stored at https://github.com/ccbogel/QualCoder-Debians Choose the most recent as it will have better features and fewer bugs.

If you want to install manually, follow these instructions to create a program launcher:

Go to your downloads folder. Make the *install.sh* script executable. The example script below assumes you are in your home directory. Open a terminal and type the following to install QualCoder:

```
cd Downloads/QualCoder
```

Run the *install.sh* file. The install process will ask for your permission to install QualCoder into the /usr/share directory. It will also download the additional python modules.

```
./install.sh
```

The install.sh script will also install various modules as well as the VLC media player. If you do not use the install script, you need to run these commands to install the modules:

```
sudo apt install python3-pip python3-pyqt5 python3-lxml python3-pil vlc qpdf
python3-ebooklib python3-ply python3-six python3-chardet

sudo python3 -m pip install pdfminer.six openpyxl
```

2.1.3 Fedora/CentOS/RHEL Linuxes

Retrieve the current package code from this repository

```
git clone https://github.com/ccbogel/QualCoder.git
```

Install dependencies

```
sudo dnf install python3-pip python3-lxml python3-ply python3-six python3-
chardet python3-qt5 python3-pillow
```

QualCoder uses an Ebook library that you can currently install via a work-around, specified at https://github.com/ccbogel/QualCoder/issues/72#issuecomment-695962784

The UNTESTED `install_fedora.sh` should install the dependencies and a desktop start icon for Fedora. The script is for python version 3.8.

2.1.4 Mac OS

Install Python3 and VLC.

Download Qualcoder-master Zip file and copy it into /Applications

In a Terminal run these commands to use python 3.9:

```
curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py python3 --version
```

Select 3.9 as an answer

```
python3 get-pip.py
cd /usr/local/bin
sudo ln -s ../../../Library/Frameworks/Python.framework/Versions/3.9/bin/pip pip
pip install pyserial
pip install pyqt5 lxml pillow six ebooklib ply chardet pdfminer.six openpyxl
/bin/bash -c "$(curl -fsSL
https://raw.githubusercontent.com/Homebrew/install/master/install.sh)"
brew install qpdf
```

To run QualCoder

```
cd "/Applications/QualCoder-master/qualcoder" python3 qualcoder.py
```

There is no desktop icon launch right now for QualCoder on Mac OS. Open a new Terminal window in the directory and launch with:

```
python3 qualcoder.py
```

Another option to run Qualcoder is shown here www.maketecheasier.com/run-python-script-in-mac/

This means you can right-click on the qualcoder.py file and open with --> python launcher. You can make an alias to the file and place it on your desktop.

3 Starting QualCoder

3.1 Linux

If you have successfully installed a Debian package or successfully run the install.sh script there will be a program launcher. Double-click to start.

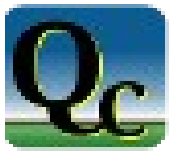

Figure 1: QualCoder launcher

Alternatively, using the terminal, move to the inner QualCoder folder and open the qualcoder.py file:

```
python3 qualcoder.py
```

3.2 Windows

In Windows create a desktop shortcut to the qualcoder.py file and double click to open.
Alternatively, using the command prompt, move to the directory and open the qualcoder.py file:

```
python3 qualcoder.py
```

From the Windows Start menu (example):

```
C:\Windows\pyw.exe "C:\Other programs\QualCoder-master\qualcoder\qualcoder.py"
```

3.3 Mac OS

Using the terminal prompt, move to the directory and open the qualcoder.py file:

```
python qualcoder.py
```

3.4 Backups

QualCoder has several backup options that can be changed in the settings. QualCoder can make a backup of a project every time the project is opened. Up to five data and hour stamped backups are created, with the oldest being deleted if there are further backups created. Backups can be restricted to only non-audio/video files, for faster smaller but less complete backups.

Another option is to not backup the project every time it is opened. However, I recommend that you make a backup before doing any substantial changes, such as reorganising codes and categories.

4 How to use

There are a few sample files in the Examples folder. These can be used to test importing files of different document formats and of importing an image. There are also example files to test importing case attributes, and for importing a survey.

4.1 Settings

The settings dialog allows you to change several features including language, coder name and font type and font size. Multiple coders can code the same text. A new coder name can be entered in the text box. You can choose an existing coder from the drop down box.

The default language of QualCoder is English. Currently French, German, Italian, Japanese, Spanish are alternative languages. These languages have not been thoroughly reviewed for accuracy of translations. When changing a language, you need to close then reopen QualCoder for the change to occur.

Checking the Show IDs box displays the numeric IDs for each code in the codes tree. For transcribing audio and video, The time format and bracket type can be selected.

Project backup can be set to automatically backup every hour, or no backup. QualCoder keeping the most recent five backups with a date and hour time stamp. The backup name is: *projectname_BKP_yyyymmdd_hh.qda* Where *hh* is 24 hour time. This also means multiple backups are not done within an hour. So a new backup cannot overwrite another backup created within the same hour. Up to five backups are kept, older ones are deleted.

Rename or move to another location particular backups that you need to keep. When the backups are set, an additional option is to choose to backup the audio/video files. For completeness of backups it is recommended to back up audio and video, however this may slow down opening of the software if you have many large files.

The default project directory is where many file operations will default to, for export or looking to import files.

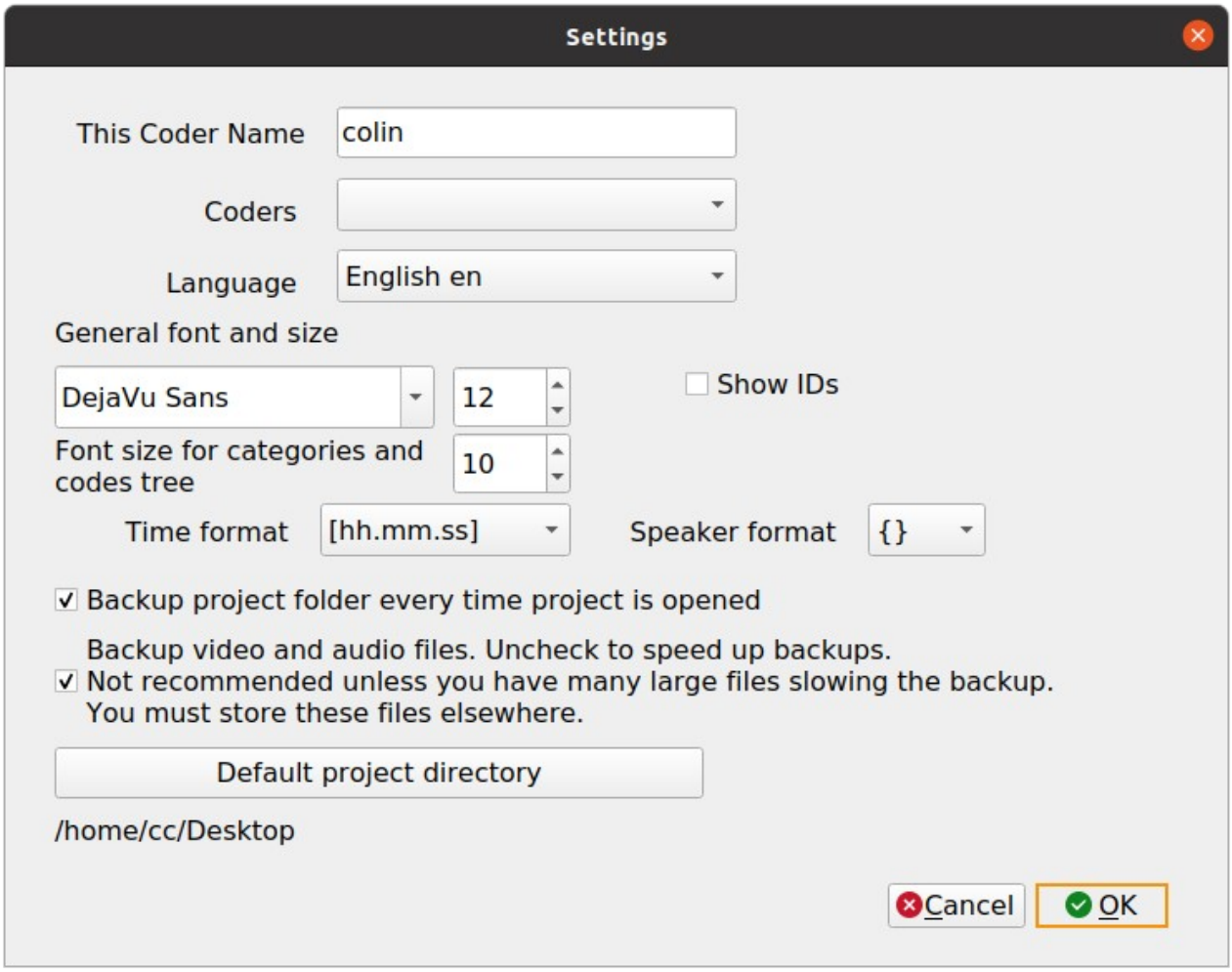

Figure 2: Settings dialog

4.2 Create a new project

Create a new project under the 'Project' menu, call it test. The project will be saved as *test.qda*. Test.qda is actually a folder containing subfolders which hold the database and other files. Additionally, in your home folder QualCoder will create a .qualcoder folder with a QualCoder.log file for logging events, a config.ini file which will contain the current coder's name, preferred fonts and a preferred working directory. There will also be a recent_projects.txt file which stores the most recdntly opened file. When opening QualCoder the most recent file will automatically be opened.

Under the *Project* menu click on *Project memo*. This is a memo about your project. Type "A test QDA project" and click the OK button.

You will notice the main window display settings and the current project in the Action log, with a menu bar at the top. It also has a second tab where you can type temporary notes.

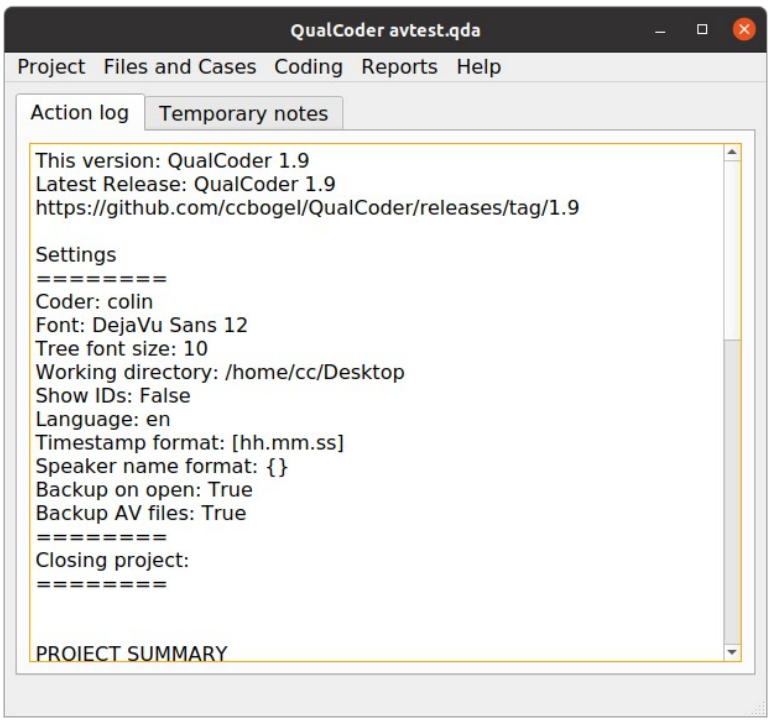

Figure 3: Main window

4.3 Files and Cases Menu

4.3.1 Manage Files

You will usually want to load text files into QualCoder prior to coding. You can import text from plain text documents, docx, odt, html, htm, md, epub and pdf documents. Html text is loaded but may need further editing to suit, as formatting will not match the original page. Pdf importing can sometimes be problematic and may need editing. Large Pdf files take a long time to import. Another option is to manually enter text from within QualCoder. You can load image files in the following formats: jpg, jpeg and png.

Files can be imported into the project folder, or they can be external to the project folder and linked to. Files that are liked are shown with a small red link in the file icon. If an externally linked file is moved or deleted, QualCoder will warn you that there is a bad link when the QualCoder project is opened.

Video (mov, mp4, wmv formats) and audio files (wav, mp3, m4a formats) can be imported. Loading an audio or video file will also automatically create a blank text transcript file. This file will have the same name as the audio or video file, but have a '.transcribed' suffix, shown in the image below. Initially, this text transcription will be empty. You can transcribe the file your self or get the file professionally transcribed and copy and paste the text into this file.

A right-click context menu allows you to view, export, delete a current file, Figure 4. The context menu also allow you to import an externally linked file into the QualCoder project folder. It also

allows you to export an internal file from the project folder to an external folder location. The small red link in the icon indicated the file is external to the project folder.

The menu also allow you to re-order the files according to alphabet, date, and file-type and when right clicking in the name or date columns.

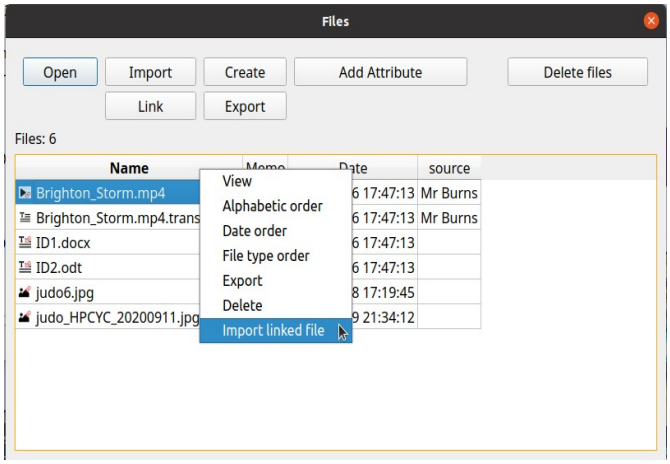

Figure 4: File manger context menu

Attributes

Attributes are variables that can be used to describe or classify the files. These can be added here or through the Manage Attributes menu option.You can show only selected attribute types, if the right-click occurs in an attribute column, shown below.

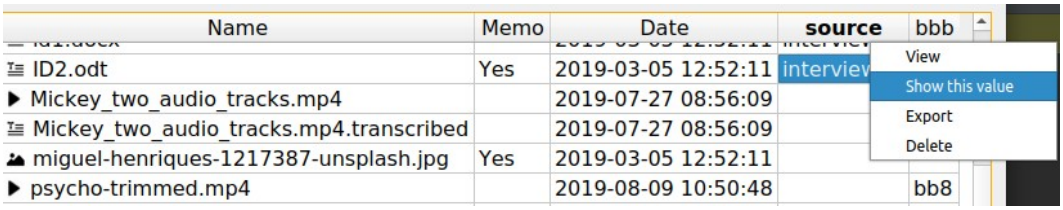

Figure 5: Right click on an attribute to show only those files that match

The below figure shows the various buttons available. Open a file to view it. Import or link to a project file. Create a text file. Export a file. Add attribut4es to the files. Delete multiple files. There is no option available to rename the files. It is best to rename files before they are incorporated into the project.

Files larger than 2 Gigabytes are not stored internally. They will always be linked externally to the project.

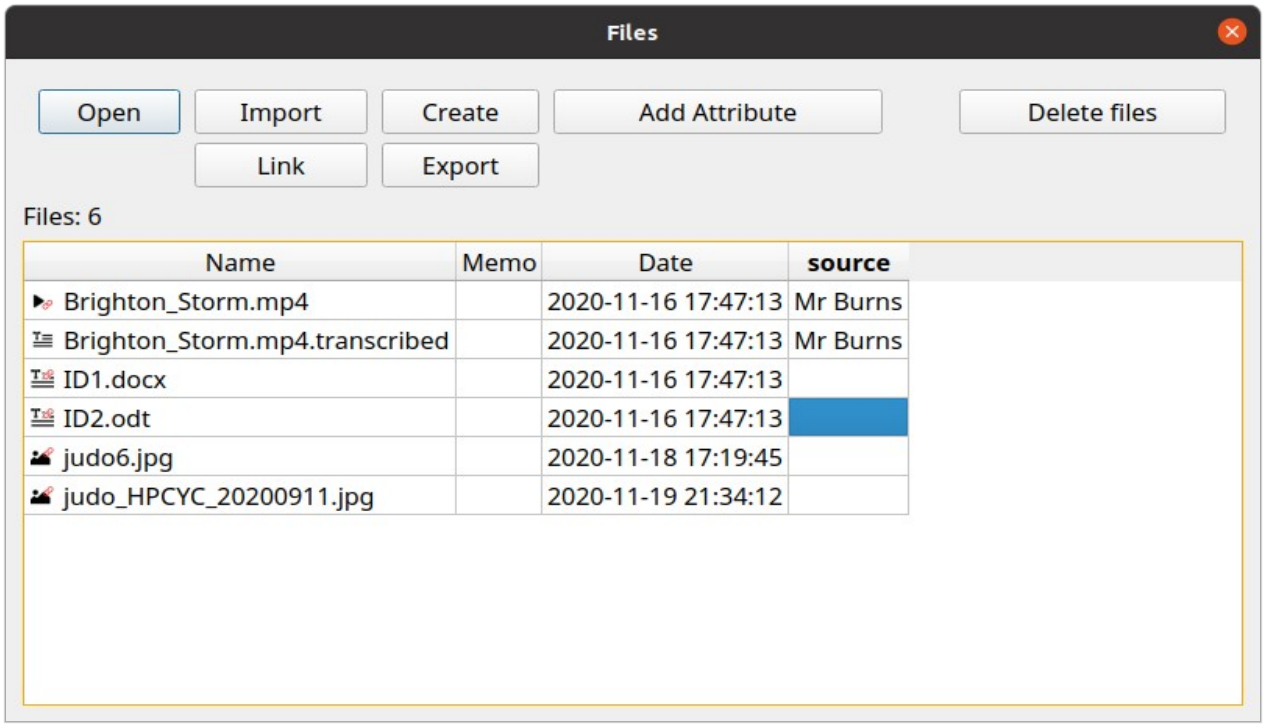

Figure 6: Manage files dialog

As a practical example: Open the *Manage Files* dialog. In the Examples folder import the following files: ID1.docx, ID2.odt, transcript.txt and the miguel-henriques.jpg.

4.3.2 Text file editing

Text files can be edited easily providing no coding or annotation or case assignment have been done with the text file. If the file has already had some coding or annotations assigned, the sections of the text file will be shown underlined in red. Editing text is now restricted to small text selections up to 20 characters. This is achieved by selecting some text then right click and select the edit text option.

4.3.3 Viewing audio and video

You can open an audio or video file to view. The video file might contain multiple audio tracks. There is a drop down box that allows you to choose another audio track.

Viewing opens two dialogs, one for viewing the video and one for the controls, shown in Figure 8. The transcribed text file must have the same name as the video file, but have a '.transcribed' suffix. The transcribed text file is stored within the sqlite database, but can be exported to a text file.

If you have a .srt file (a translation file that is read by VLC) you can place this alongside the video inside the project folder, in the video folder, shown in the image below. When the video is played, the translation wording will be shown as subtitles in the video. Also, if you open the .srt file in a text editor, copy and paste this into the video.mp4.transcribed text file. Then this text will be shown as the transcription for the video.

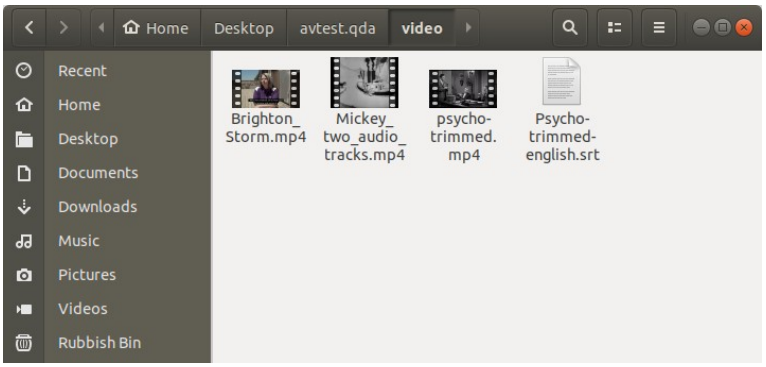

Figure 7: srt file location

4.3.4 Transcribing audio and video

QualCoder does not have an audio to text feature. Other services such as otter.ai or the python module vosk may assist you.

Transcriptions should contain timestamps indicating when the text is being pronounced during the video. The following formats are recognised by QualCoder, where SSS are milliseconds:

[hh:mm:ss], {hh:mm:ss}, [mm:ss], [hh.mm.ss], [mm.ss], #hh:mm:ss.SSS#

hh:mm:ss,SSS --> hh:mm:ss,SSS

Transcriptions should contain timestamps and speaker names indicating who is speaking. Speaker names are bracketed in this format: [name] or {name}. Dots '.' and colons ':' cannot be used in speaker names.

Manually transcribing audio and video is helped with some keyboard shortcuts. Transcribing and adding or editing text can only occur if the existing text has no codes or annotations.

The shortcuts available are:

Ctrl R Rewind 5 seconds

Alt R Rewind 30 seconds

Alt F Forward 30 seconds

Ctrl S or Ctrl P Stop/Start toggle audio/video. From stop to play will rewind 2 seconds.

Ctrl T Insert timestamp in this format: [hh.mm.ss]

Ctrl +N Add a speaker name. This also pauses the audio/video.

Ctrl D Delete one or more speaker names.

Ctrl 1 to 8 Insert speaker name in this format: [name]

Ctrl Shift > Increase play rate up to 2 times

Ctrl Shift < Decrease play rate down to 0.1

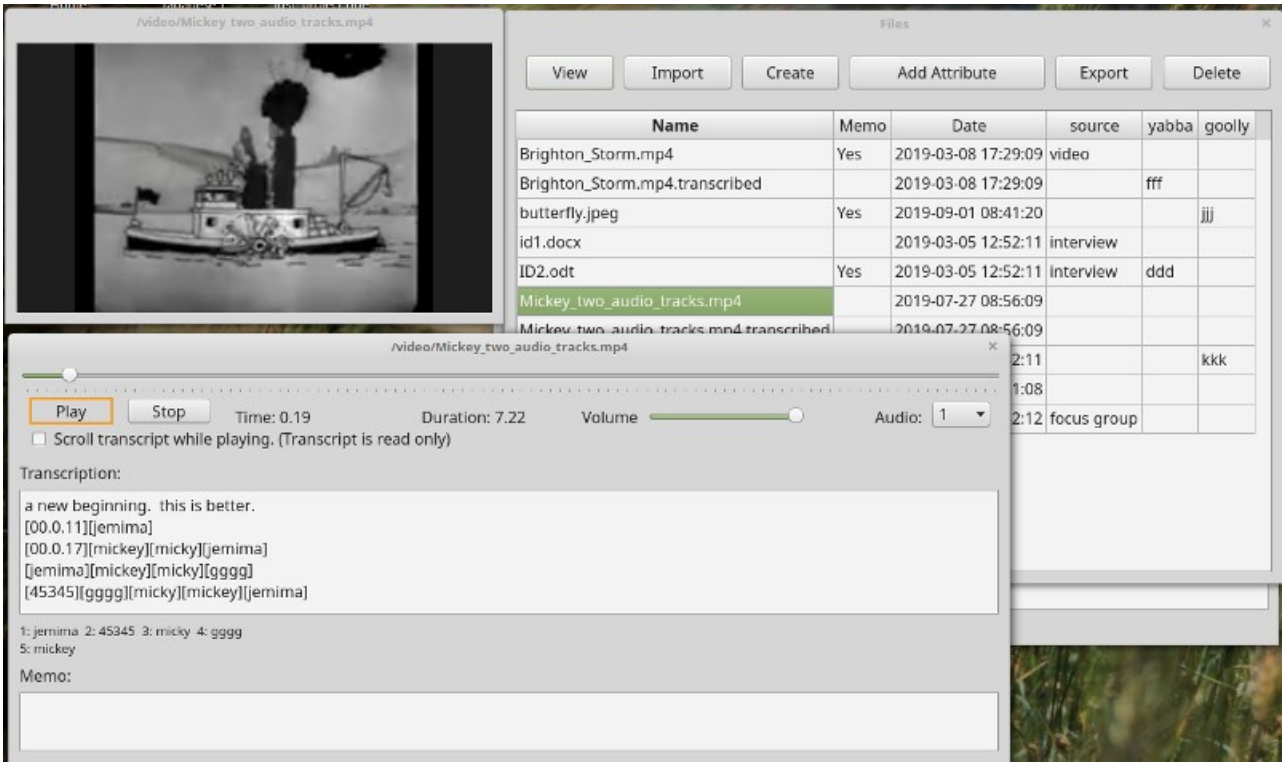

Figure 8: Video and control dialogs when viewing audio or video

4.3.5 Manage Cases

Open the *Manage Cases* dialog, shown in Figure 9.

A table lists the cases. On the right had side the text of a case is displayed. The number of files associated with a case is shown. Click on the files cell in the table to add or changes files associated with a case. This displays the case file manager dialog, described below.

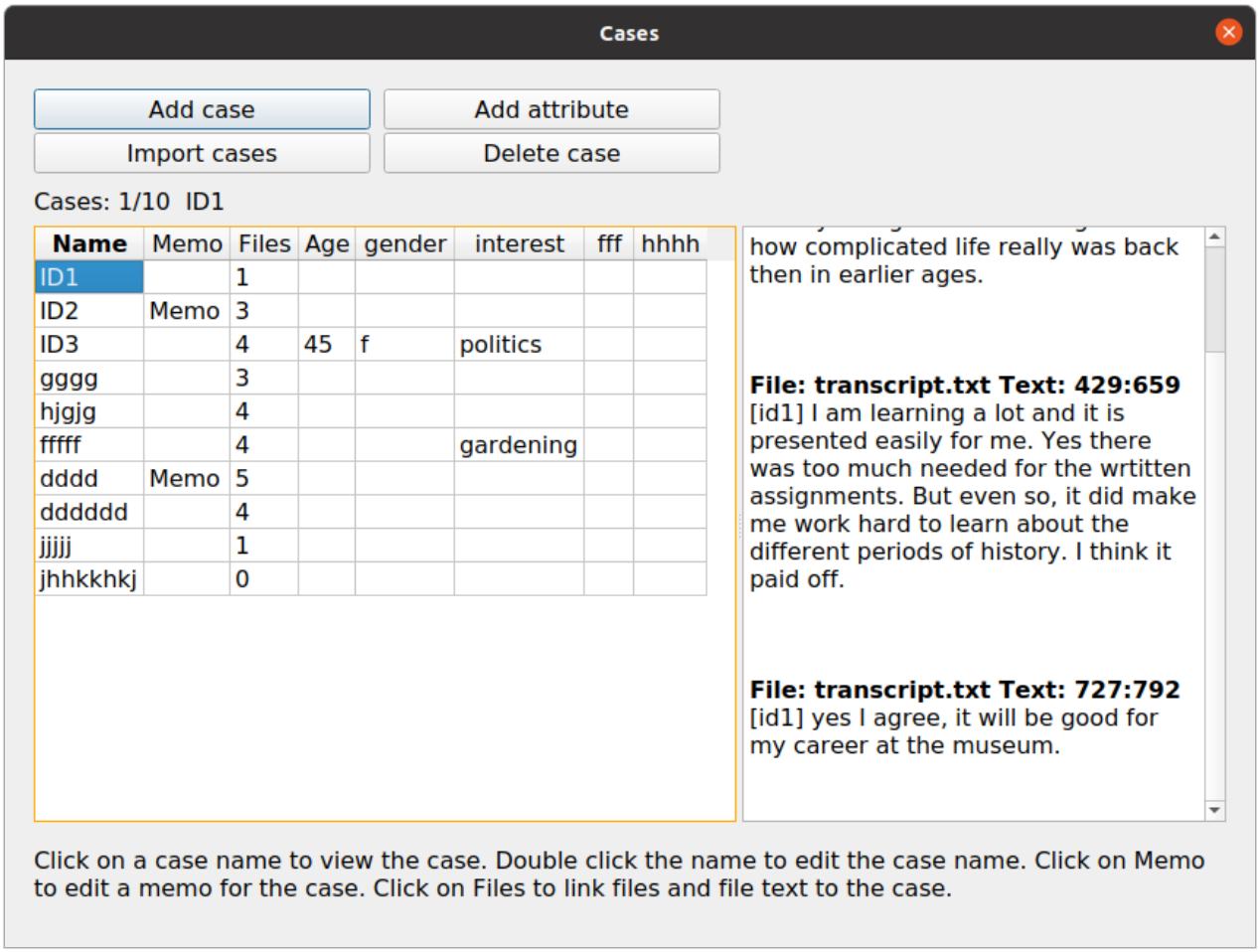

Figure 9: Manage cases dialog

Cases are useful for seeing text and imaged linked to particular cases and for assigning attributes such as age and gender to interview participants. You can rename a case by double-clicking on a case name.

Practical example: Add the three students (or cases) here by clicking the *Add case* button. Call each student: ID1, ID2 and ID3.

Now, add each student's file to each student. Click on the cell in the Files column for case ID 1 for example. This opens the case file manager dialog.

In the *case file manager*, click on a case, say ID3, then click *Add selected files to case* button. Select one or more files in the files list. Add the file(s) to the case. For example add the miguel-henriques.jpg to ID3. You can remove files and view the files associated with the case. You will see file text will be underlined in red which indicates this text is associated with this case.

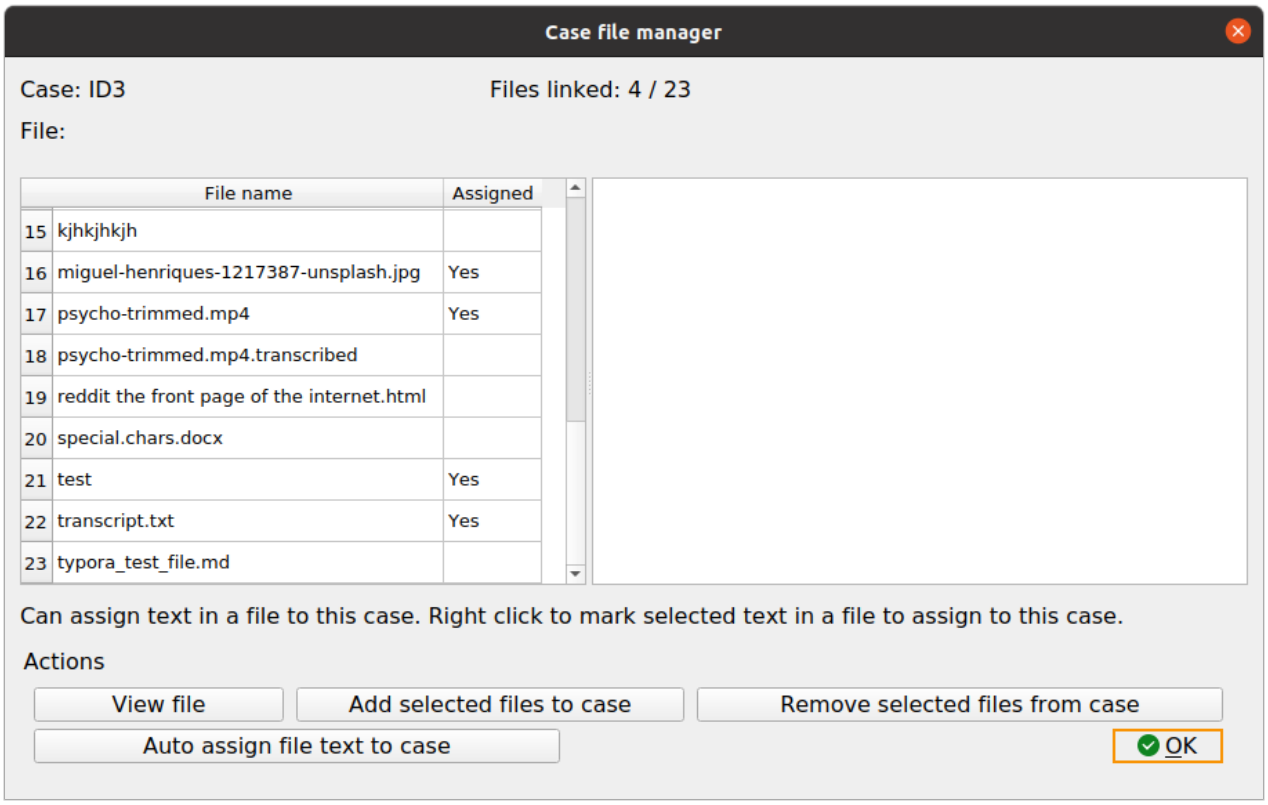

Figure 10: Case files manager

Now open the transcript.txt file. Notice the transcript begins with a student id inside square brackets [ ].

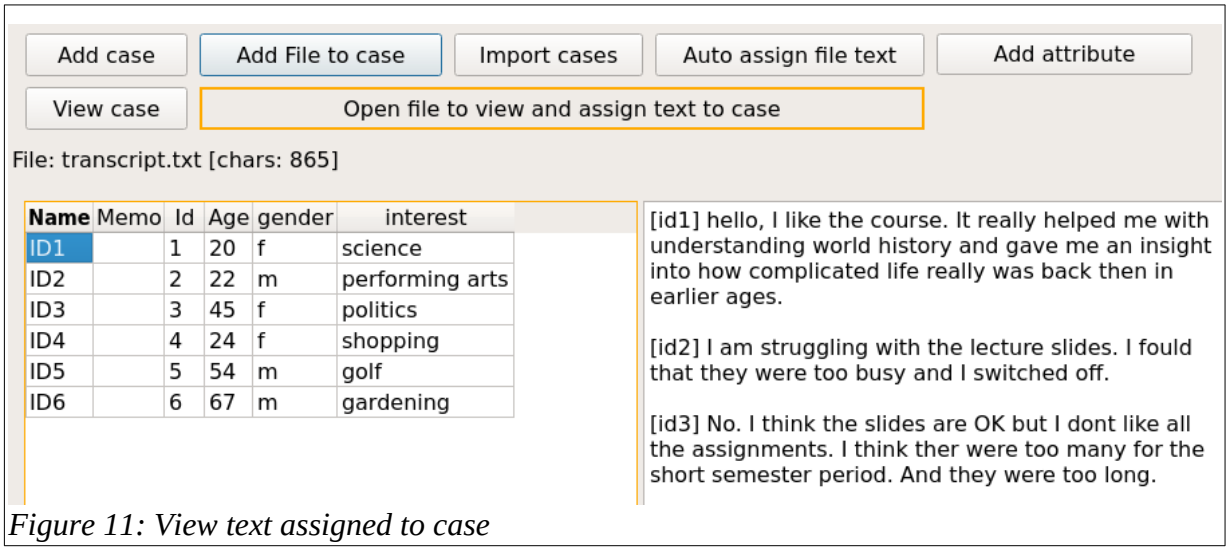

Figure 11: View text assigned to case

Try automatically assigning text to ID1 by selecting case ID1 then clicking the *Auto assign file text* button. You will be asked which file or files to assign the case to. Select *transcript.txt* from the list. Next you need to enter the start and end marks. The start mark will be '[id1]' and the end mark will be '[', note this is case sensitive so that is why you use the lower case here.

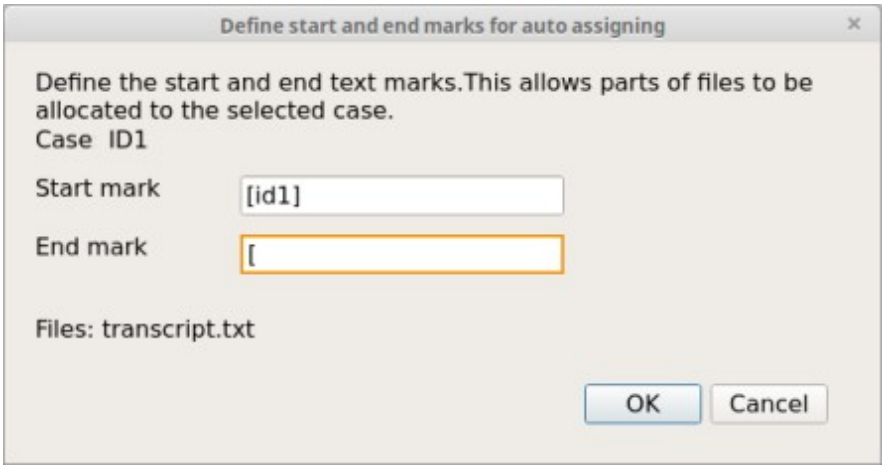

Figure 12: Auto-assign text to case

Now select the case ID1 and see the assigned text.

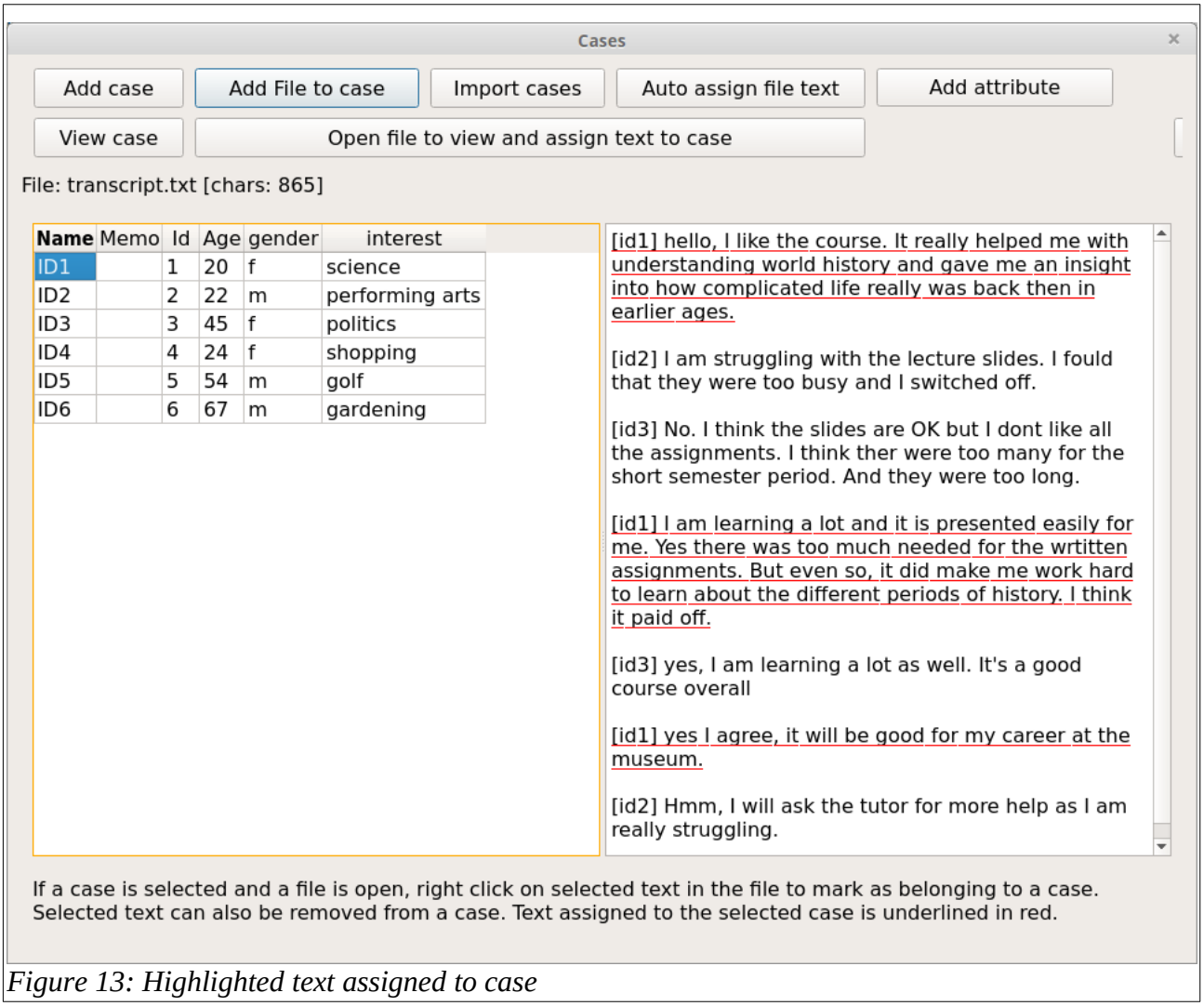

Figure 13: Highlighted text assigned to case

You can also select a case text file, manually highlight text, and right-click to mark (or assign) the text to the case.

Importing attributes for the cases. You can import attributes from a CSV file. The first row must contain the attribute headings. The first column must contain matching case names (for this example: ID1, ID2, ID3). Note that this is case sensitive. Open the attributes.csv file in the Examples folder to see how it is laid out.

For this example – delete all the cases shown. Then, import the attributes from the attributes.csv file through the *Import Attributes* dialog. You will again need to link the files and file text to each case.

4.3.6 Attributes

Attributes are variables associated with files or cases. They can be useful to add context to the text analysis. Open the *Manage Attributes* dialog. You can add, delete, rename and add memo notes to attributes. Attributes are stored as text, but numeric attributes are generally interpreted as numbers. However, if you are running SQL queries you may need to cast the numeric attribute to an Integer or Real: *cast(my_var as integer)*

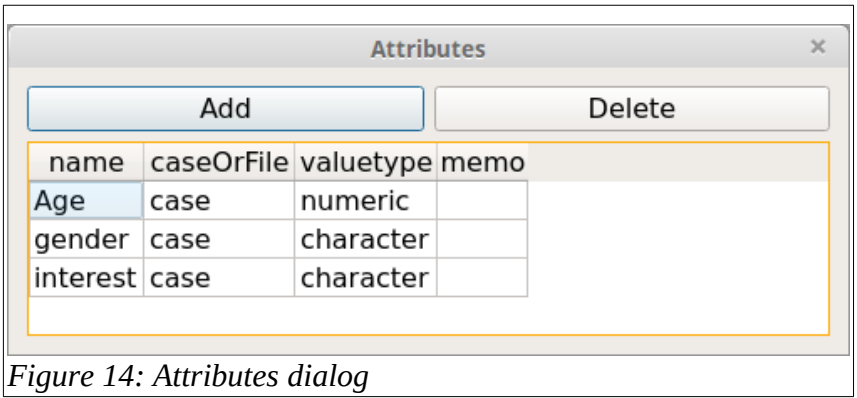

Figure 14: Attributes dialog

It is not the intention for QualCoder to perform statistical analyses of the attributes. It would be preferable to use dedicated statistical software such as R (https://www.r-project.org/) or other such software.

4.3.7 Journals

You can record your thoughts when coding your data in journals. Make use of these to develop ideas and themes.

4.3.8 Manage bad links to files

If your project contains externally linked files, these files can be moved, renamed, or deleted. The Mange bad links window allows you to edit the existing link and replace it with a new one, by finding the correct file and it's location.

4.4 Coding menu

4.4.1 Categories and codes

Categories are used to organise codes. Categories are organised hierarchically in a tree structure. You can move codes into categories and move categories into larger categories. You can move categories and codes out of their current position. Codes and categories can be merged by dropping a code onto a code or a category onto a category. Categories and codes can be assigned memos. Right-click on a category or code to rename. Right click on a code to change the color.

To reduce the number of codes shown in the code tree. In the coding windows (code text, code, a/v or code image), right-click on the code tree and select *Show codes like* from the menu. Then enter text in the text box. This will then only show codes that contain that text. Enter nothing into the text box and press OK to show all codes again.

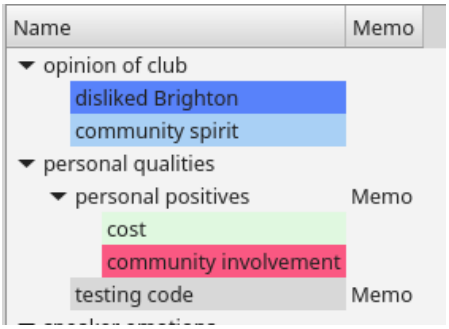

Figure 15: Categories and codes

4.4.2 Coding text

Select *Code text* from the *Coding* menu. This is the central dialog for assigning codes to text. Once text segments are coded, hovering the mouse over the coding shows the code name as a tooltip. Clicking on the coded segment also shows the code name. Press the *View File* button to select a file to open for coding. Create a new code by right-clicking in the left hand window.

Codes can be assigned a colour by right-clicking on the code and selecting the *change code colour* option. Other options from the right-click menu include adding a memo to the code, deleting the code, renaming, adding a new code, and adding a new category.

The easiest way to code text, is to select some text, then left-click with the mouse on a code.

A second way is to select a code, then select some text. Right-click and mark the text to assign it to the selected code. Hover the mouse pointer over coded text to see a tooltip of the code. Coded text can be uncoded by clicking on the text segment and pressing the *Unmark* button.

Overlapping codes can be difficult to view clearly. Overlaps have an overline above the text to show overlapping sections. Mouse hover will show coded text, including overlaps. Clicking in an overlap shows a selection box at the top of the screen where you can select to view one or the other highlighted coded text.

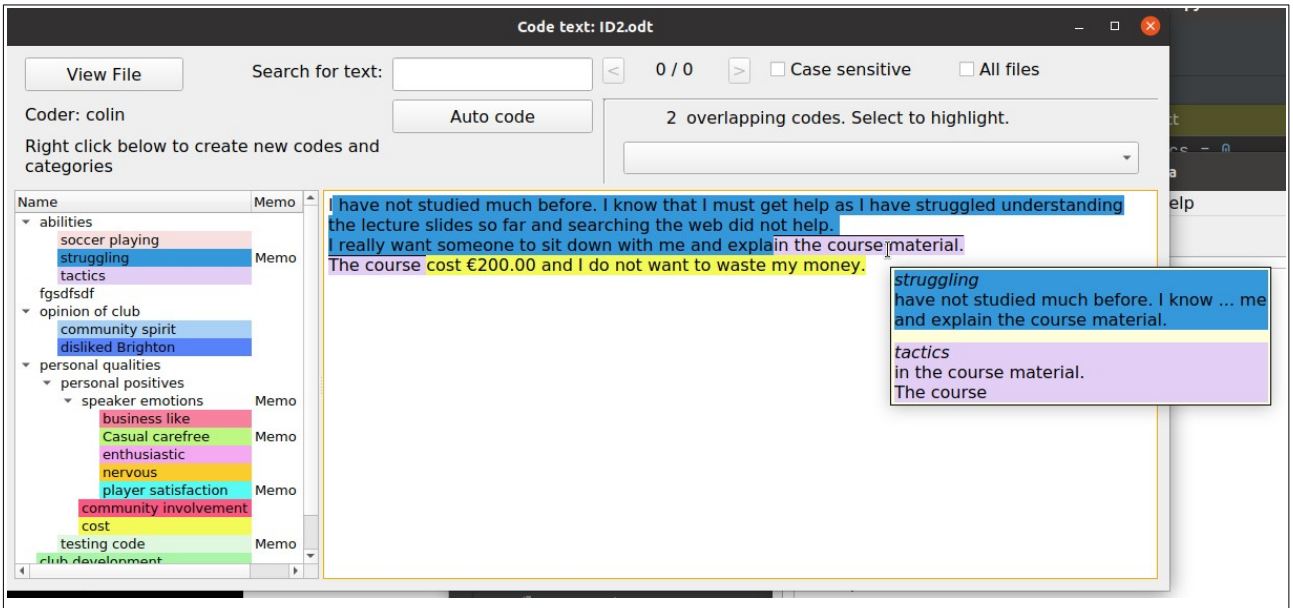

Figure 16: Coding text dialog showing overlapping codes identified with an overline

Add an annotation (like a memo for a text segment) to a text selection. The text will become **bold** to mark the position of the annotation. To re-open an annotation, select some of the bolded-text and right-click to get the Annotate option.

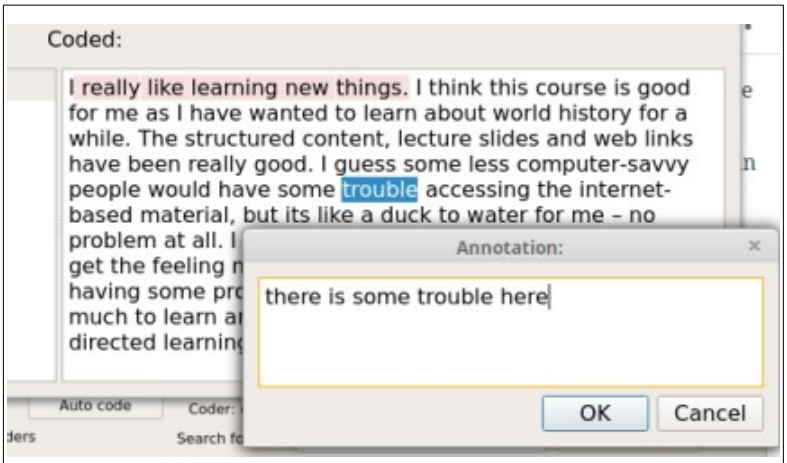

Figure 17: Adding annotation to text

Auto code

You can also automatically code text segments using the *Auto Code* button. Enter the text you want to auto code. A dialog asks for one or more files to auto code. All matching text will be assigned the selected code. Multiple sections of text can be assigned by auto code using the pipe '|' symbol. For example, *politics|politicians* can be assigned to the same code at the same time.

You can right-click on the Auto code button to have additional auto code options, shown below. These options allow you to code an entire sentence based on the text you enter into the text box, only in the Current text file, or in All text files. You must also define the end of a sentence, there is a default setting with a period and space.

There is an option in the menu to undo recently performed auto-coding. Although if the project is closed and reopened, the undo option will be lost.

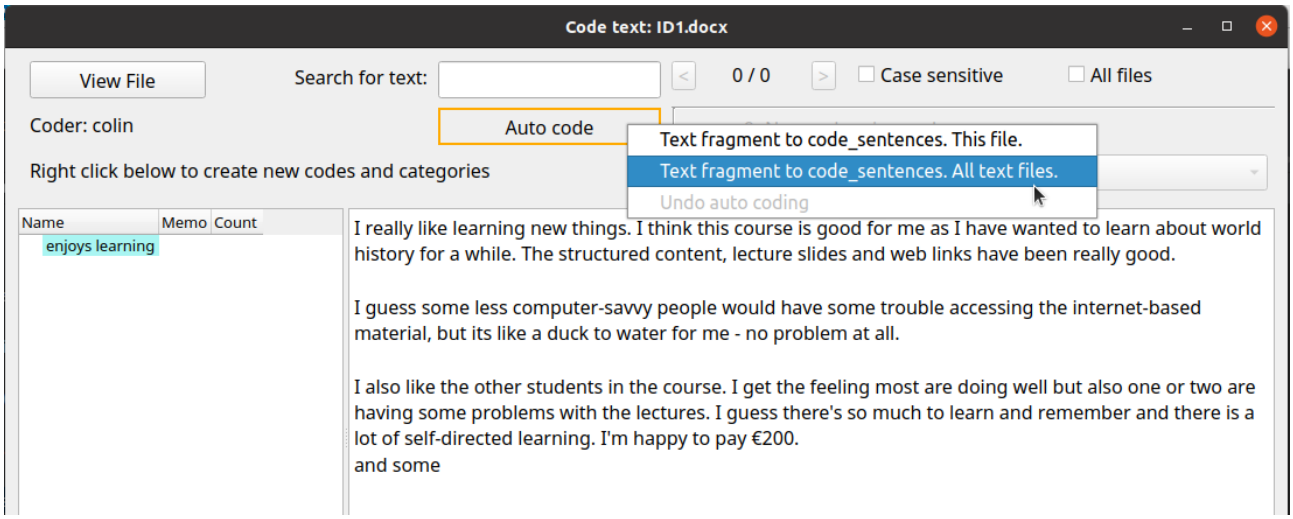

Figure 18: Auto code right-click menu options

Convenience methods for loading text files

Some projects may have many text files and the view file dialog may present too many files to open. Right-click on the *View File* button to select options such as: the next file alphabetically, select the file which was most recently coded, or go to a bookmarked location in a file. To create a bookmark, right click in some text when coding and select the *bookmark* option. If you select *Go to bookmark* the text file will be loaded and the bookmark position will be shown, as a selected character.

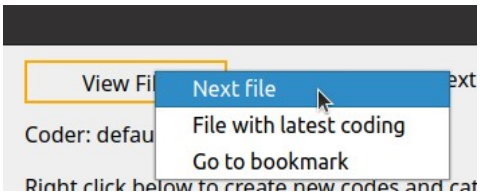

Figure 19: Alternative way to file a file to view

Modifying code positions

When in the text area, click on a code with the mouse (Note the code must not be overlapping with another code at that position). Press the following key combinations to extend or shrink the coded

text segment.

Shift + left arrow	Extends coded text to the left
Shift + right arrow	Extends coded text to the right
Alt + left arrow	Shrinks coded text from the right hand side towards the left
Alt + right arrow	Shrinks coded text from the left hand side towards the right

You can also right-click on a code and select c*hange start position* or *change end position* by a number of characters.

4.4.3 Coding images

Images can be coded in a similar way to text coding. Select a code. Left-click and drag to highlight the area you want to assign to the code. Right-click will open a menu where you can remove the coding or add a memo. At the bottom of the screen there is a slider control to re-size the image. Coded rectangles are coloured to match the code colour.

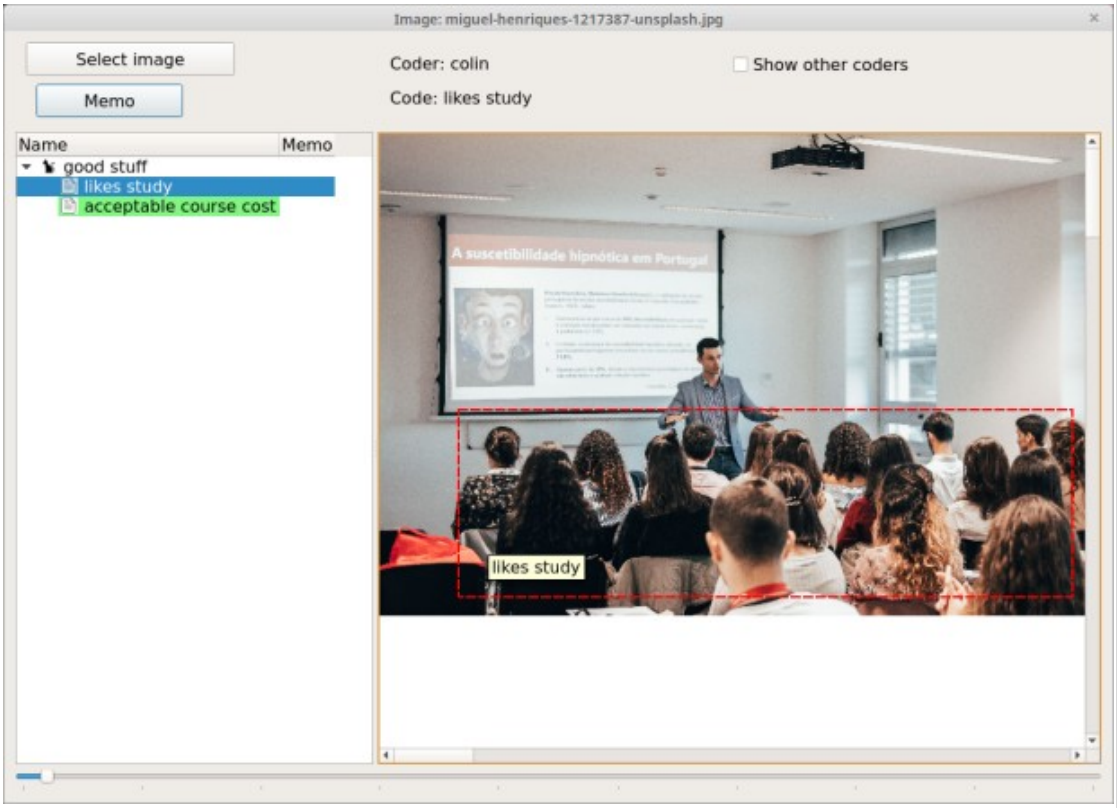

Figure 20: Picture coding showing code tooltip

4.4.4 Coding audio and video

When coding audio or video, two windows are displayed, shown below. One window has the audio or video playing. The other window has the controls and a button to begin and end a coded segment.

The controls window shows the codes in the bottom left pane and the .transcribed file text is shown in the bottom right pane. The transcription text can also be coded and annotated in this window. Right-clicking on a timestamp will give you a menu option to go to that section of the video. If a video has multiple audio tracks, you can change the audio track too. Checking the scroll checkbox allows the transcript to scroll in time with the video, based on detected timestamps, however, you need to uncheck the scroll to be able to code the transcript.

- Ctrl R and Alt R are shortcuts to rewind 5 or 30 seconds.
- Ctrl F will forward 30 seconds.
- Ctrl S and Ctrl P will stop/start, play/pause.
- Ctrl Shift < will slow play rate down to a minimum of 0.1.
- Ctrl Shift > will increase play rate up to two times.

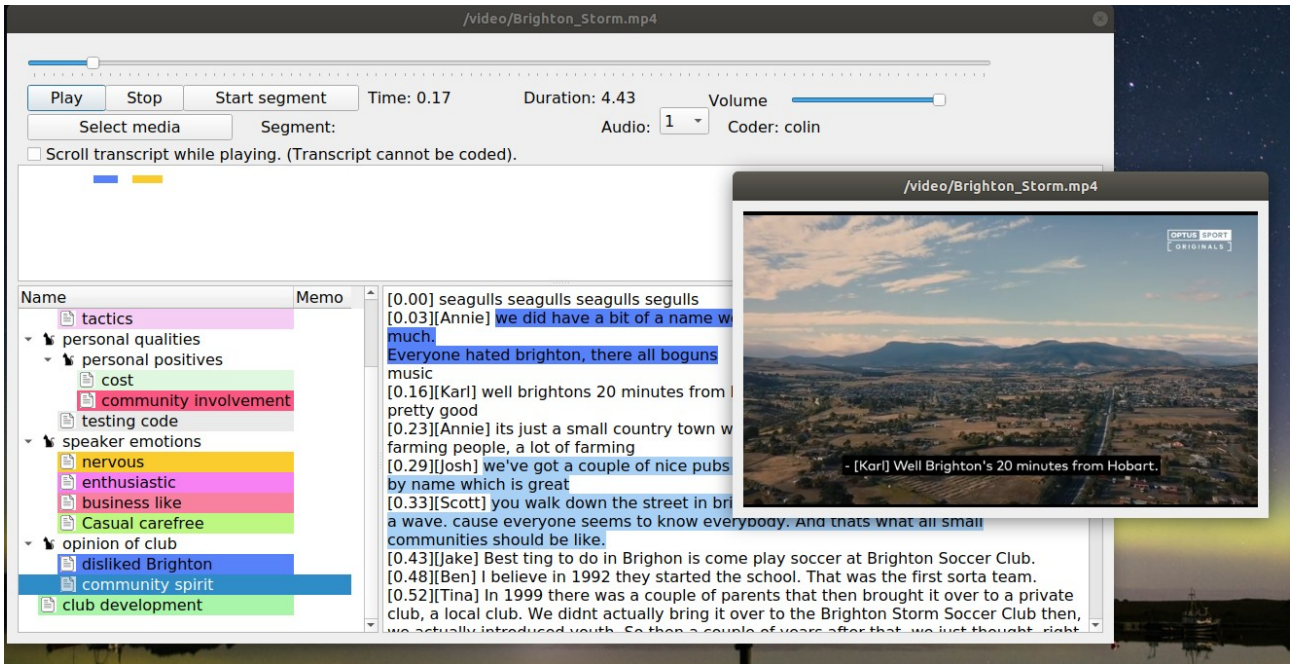

Figure 21: Audio/video coding dialogs

Audio Video segments

Once a segment is made using the *Start segment/Stop segment* button this can be assigned to a code by right clicking on the relevant code and assigning the segment.

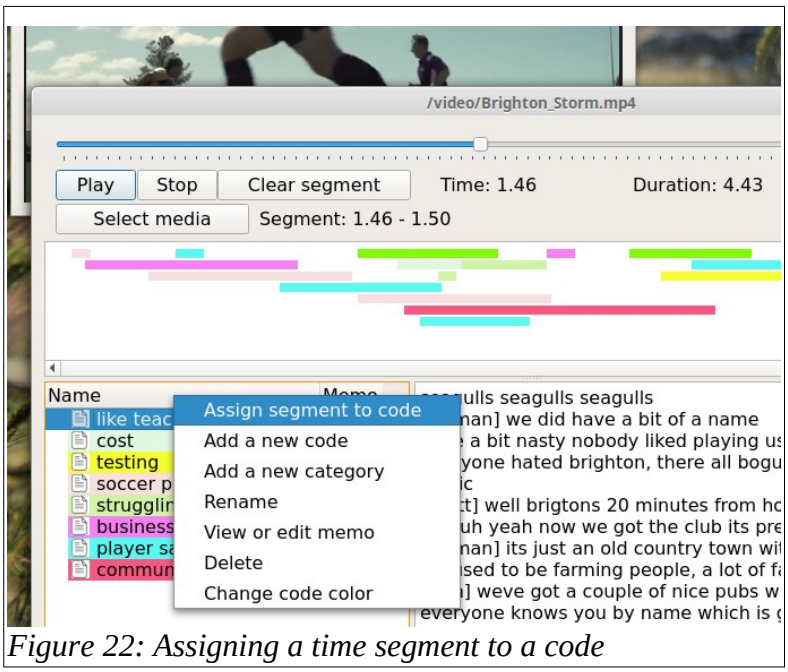

Figure 22: Assigning a time segment to a code

Coding stripes for the coded segments are shown in the upper pane. Hovering the mouse over each stripe shows the code name, time segment and any memo attached to that coded segment. Right clicking on a coded segment stripe shows a menu that can be used to edit the memo or delete the coded segment or play from this point. Coded stripes are shown on various lines so that they do not overlap.

The transcript text can also be coded and annotated in this dialog. However, when the Scroll transcript check box is checked, this cannot be performed. Playing the video when this is check will scroll the transcript using the timestamps in time with the video.

Linking text to coded segments

There are two ways to link text and coded segments.

One way is to select text (it can be coded or preferably uncoded) then assign it to a segment. This is done in two steps shown in Figure 23. First select the text and right-click P*repare text link to segment*. Then right-click on the receiving segment, choose *Link text to segment*, to assign the text.

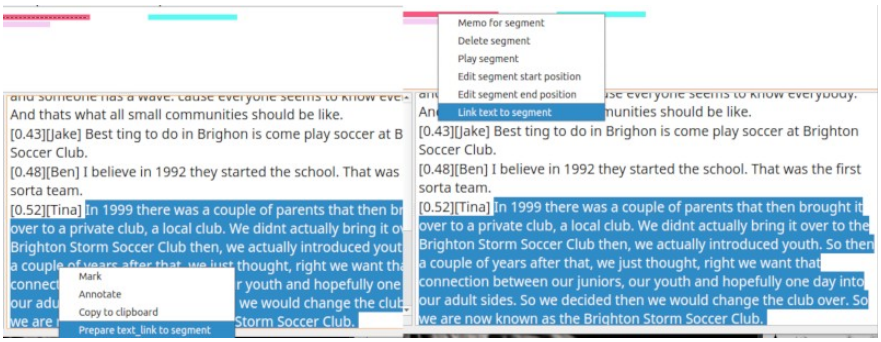

Figure 23: Assign a text selection to a segment

The second way is to select a segment and link it to a text selection via a similar process.

Modifying code positions in the text area

When in the text area, click on a code with the mouse (Note the code must not be overlapping with another code at that position). Press the following key combinations to extend or shrink the coded text segment.

Shift + left arrow	Extends coded text to the left
Shift + right arrow	Extends coded text to the right
Alt + left arrow	Shrinks coded text from the right hand side towards the left
Alt + right arrow	Shrinks coded text from the left hand side towards the right

You can also right-click on a code and select c*hange start position* or *change end position* by a number of characters.

The video window

On the video window you can right-click and have options to change the window size, in pixels. You can also export a screenshot. The screenshot will be save as *Frame_yyyymmdd_hh_mm_ss.jpg* in the directory listed in the Settings.

4.5 Reports

4.5.1 Coding Reports

This dialog gives a list of coded text based on your selections. One or more codes need to be selected and one or both of *coder 1* and *coder 2* need to be selected. The *Search* button will present the results. If a category is selected all codes in that category are also selected. Multiple categories can be selected using the mouse and the Shift or Ctrl button. Codes and categories can be sorted to help find the codes of interest.

Codings can be narrowed down by using the *File selection Case selection* or *Attribute selection* buttons. Only codings within the selected files or cases will be presented. If text is entered into the *Search text* field, only codings which contain the matching text will be presented. Codings can also be narrowed down to case selections using the *Case selection* button. Note that when case selections are used, file selections are ignored. Also when file selections are used, case selections are ignored.

The *Search Text* box also limits the reported codings. The search text looks for any codings in text that contain the search text. The search text also looks for matching text in memos for coded image areas and coded audio/video segments. The search text function must be used in combination with *File selection, Case selection* or *Attribute selection*.

The *Attribute selection* button opens a dialog window where you can select attributes for files and

cases, for example: only interview files for people aged > 60.

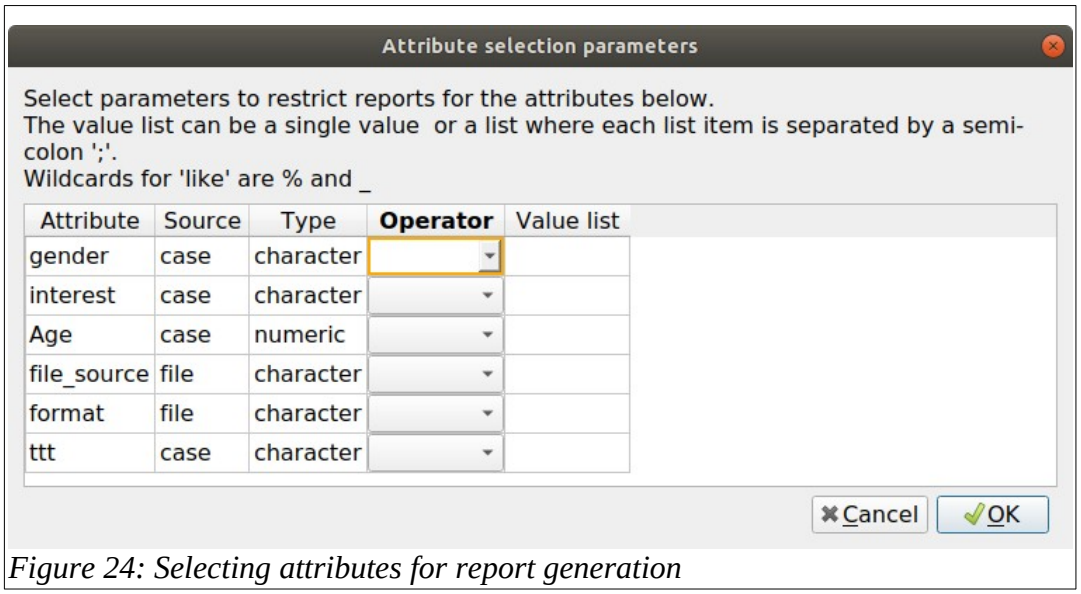

Figure 24: Selecting attributes for report generation

If you are creating a report based on Case selection, then the code tree pane is hidden. Instead two panes are shown. The left pane shows the codings in a list, the right pane shows a matrix with one case on each row and top-level categories in each column, shown as below:

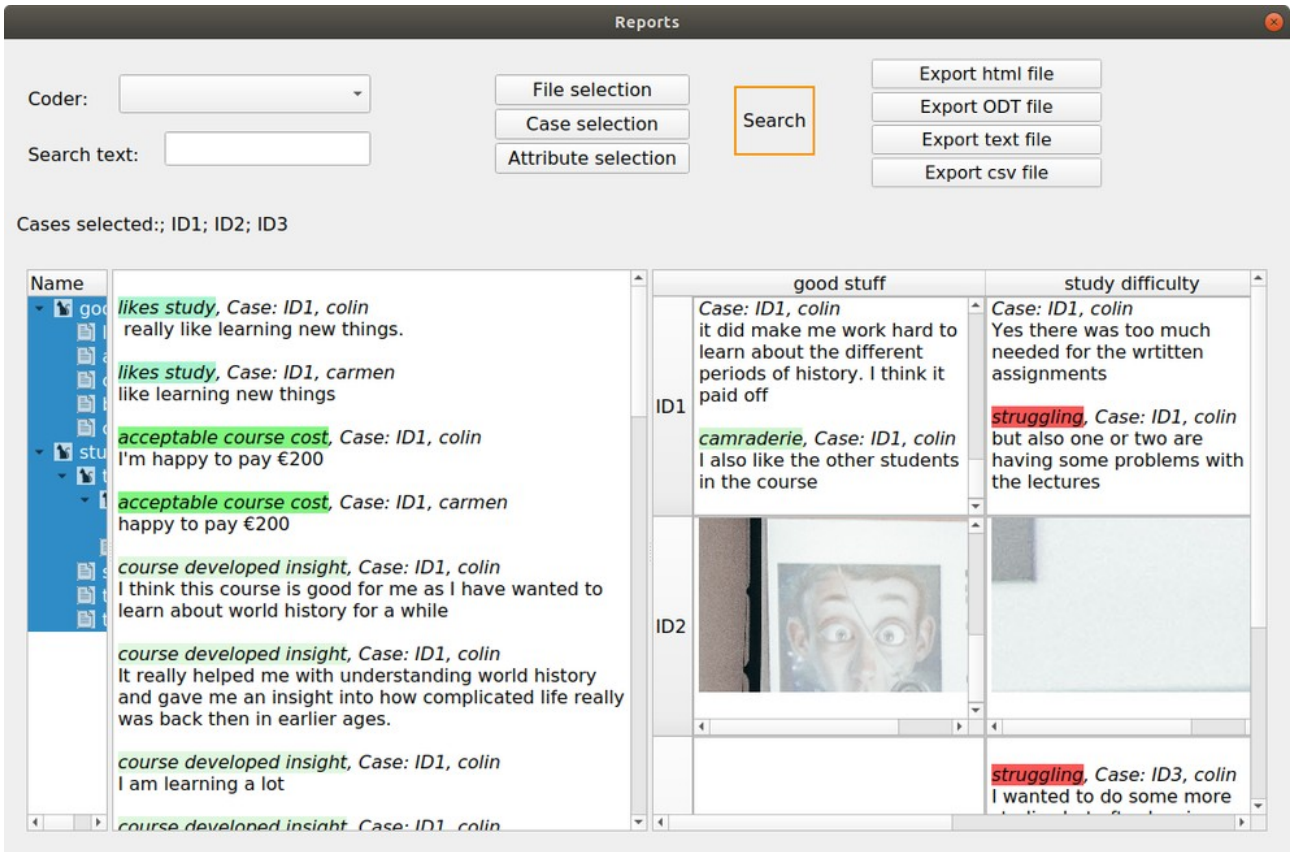

Figure 25: Case report showing code results and case by category matrix

Each of the three panes can be widened or narrowed by dragging with the mouse on the bar that splits each section.

Reports can be exported to text, open document or html files. HTML files are provided as the main html file and a supporting folder which provides, images and audio or video media. Reports can also be exported as a csv file, where each column is a code.

Currently case matrices are not able to be exported.

4.5.2 Node graph

A graph of categories and codes is displayed. There are several options to change what is shown – such as Black and White, All or selected categories. There are two display styles – list view which is ordered with categories and codes or circular view. The circular view fans the codes and categories out, but you may need to move some around as they can overlap of you have many.

Each code or category can be moved around by clicking near the edge of the box and dragging it around. Clicking on the text allows you to temporarily change the code or category wording. Right-clicking in a code gives a menu of options such as displaying the memo, or displaying all the case or file text that has been coded with the selected code.

Right-clicking on a line allows you to change the thickness, change to dotted line style or change the colour to red. This might be useful for emphasis.

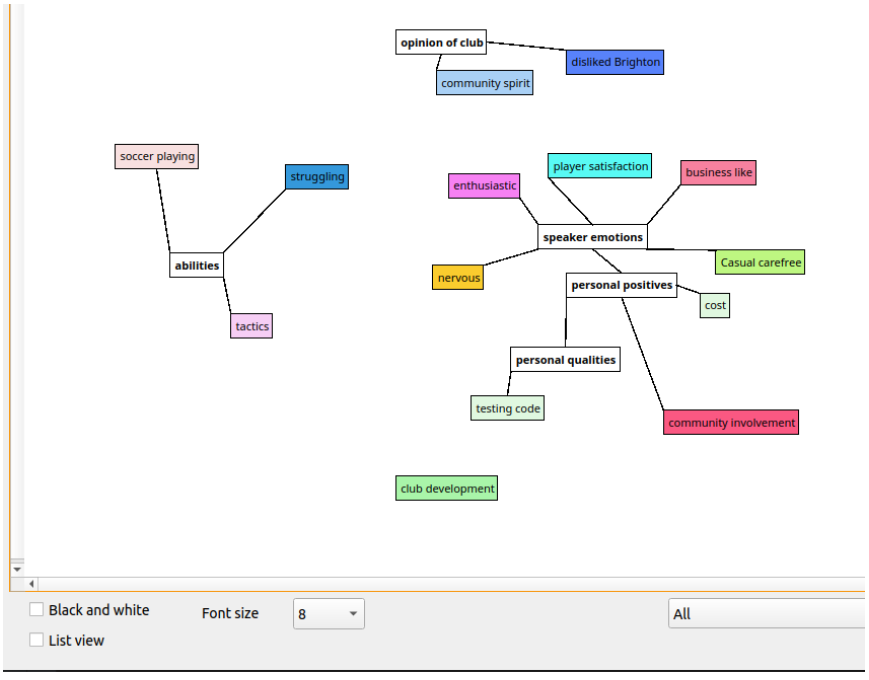

Figure 26: Circular view of categories and codes, after adjusting positions

4.5.3 Coding Comparison

This option shows the similarities and differences between two coders. Select two coders and click the *run comparisons* button. Coder comparison is only available for coded text, not coded media files. For each code:

Agreement % shows agreement for a combination of coded and non-coded text characters.

A and B % shows agreement for the only the coded text characters divided by the total characters in the text.

Not A and Not B % shows the total of the uncoded text divided by the total characters in the text.

Disagree % shows the percentage of all the coded and non-coded text that did not match between coders. It is the same as 100 – the Agree %.

Cohen's Kappa is calculated based on the information in Wikipedia https://en.wikipedia.org/wiki/Cohen%27s_kappa

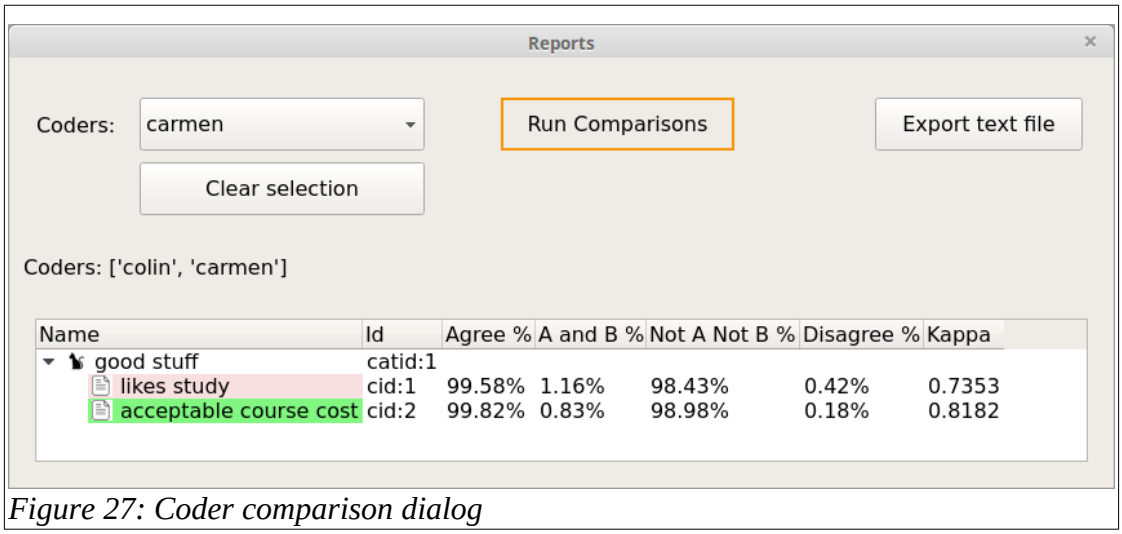

Figure 27: Coder comparison dialog

4.5.4 Code relations

This dialog show the relations between two or more codes. This can only be applied to text files. The relations are:

Proximity – Two codes do not overlap. The distance in number of characters is shown.

Overlap – Two codes partially overlap. The lowest and highest character positions of the combination are shown. The union of the overlapping section is shown in character positions.

Inclusion – One code is included within another code. The lowest and highest character positions of the combination are shown. The union of the overlapping section is shown in character positions.

Exact – Both codes match in their start and end positions. The lowest and highest character

positions of the combination are shown. The union of the overlapping section is shown in character positions.

A csv file can be exported.

4.5.5 SQL Statements

This dialog contains three panes. The top pane is where SQL statements are entered and the bottom pane contains the results of queries. The left pane contains tables and field names. Double-clicking on a field name adds it to the SQL statement.

Results can be exported to a delimited file.

If you are not familiar with SQL take care as you will be able to update and delete the data as well as select data. Note: Some Unicode symbols are not converted to plain text and are ignored.

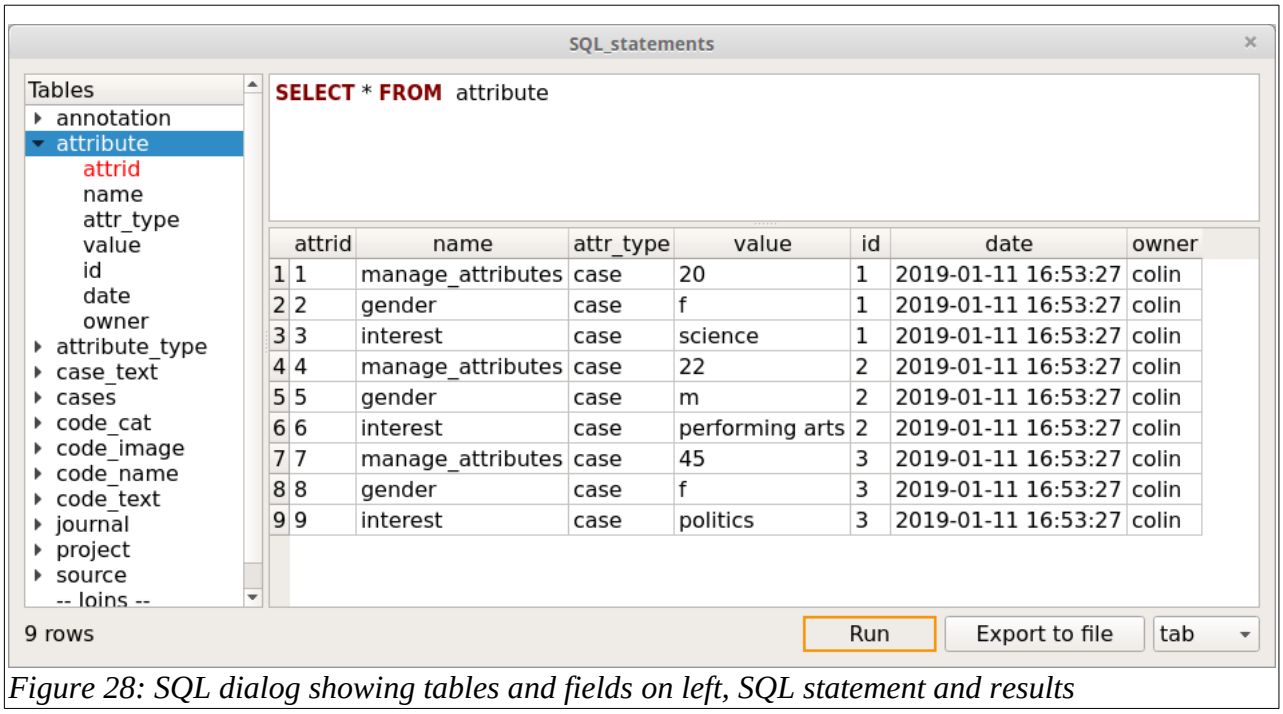

Figure 28: SQL dialog showing tables and fields on left, SQL statement and results

Most table fields are text. The following fields are integer: *anid, avid, attrid, caseid,catid, cid, fid, id, imid, jid, pos0,pos1, x1, y1, width, height.*

There are several prepared join statements listed:

- Case text
- Codes fileid and coded text
- Coded text with each case

- Get coding table – an implementation of the RQDA function of the same name

Most table fields are text. The following fields are integer: anid, avid, attrid, caseid,catid, cid, fid,

id, imid, jid, pos0,pos1, x1, y1, width, height.

Right-click in the results table for filtering options.

Right click in the SQL window give you various options such as select all, copy, paste.

4.6 Dialog windows

It is possible to have some multiple dialog windows open. This is useful if you have run a report, or have a file open for coding, and you want to enter your thoughts into a journal entry.

Some dialog windows are priority windows, so swapping between windows will not be possible, these restricted windows are: survey import and confirmation dialogs (e.g. confirm delete) and project memo.

5 Imports and exports

5.1 Import survey

This requires a CSV or Excel (xlsx format) file. You can try importing the survey.csv file in the Examples folder.

Survey files in a CSV format, are comma delimited format. Another delimiter can be chosen. For tab-delimited files type *ta*, *tb*, or *tab* in the Delimiter box so that QualCoder knows the csv file is tab delimited. The first row must contain the headings for attributes. **The first column must contain the unique identifiers for each survey respondent.**

QualCoder will determine if the other columns (attributes) are Numeric or Character. QualCoder cannot determine if an attribute is qualitative data. You must right-click and change the field type from *character* to *qualitative* for those fields that need to be qualitative.

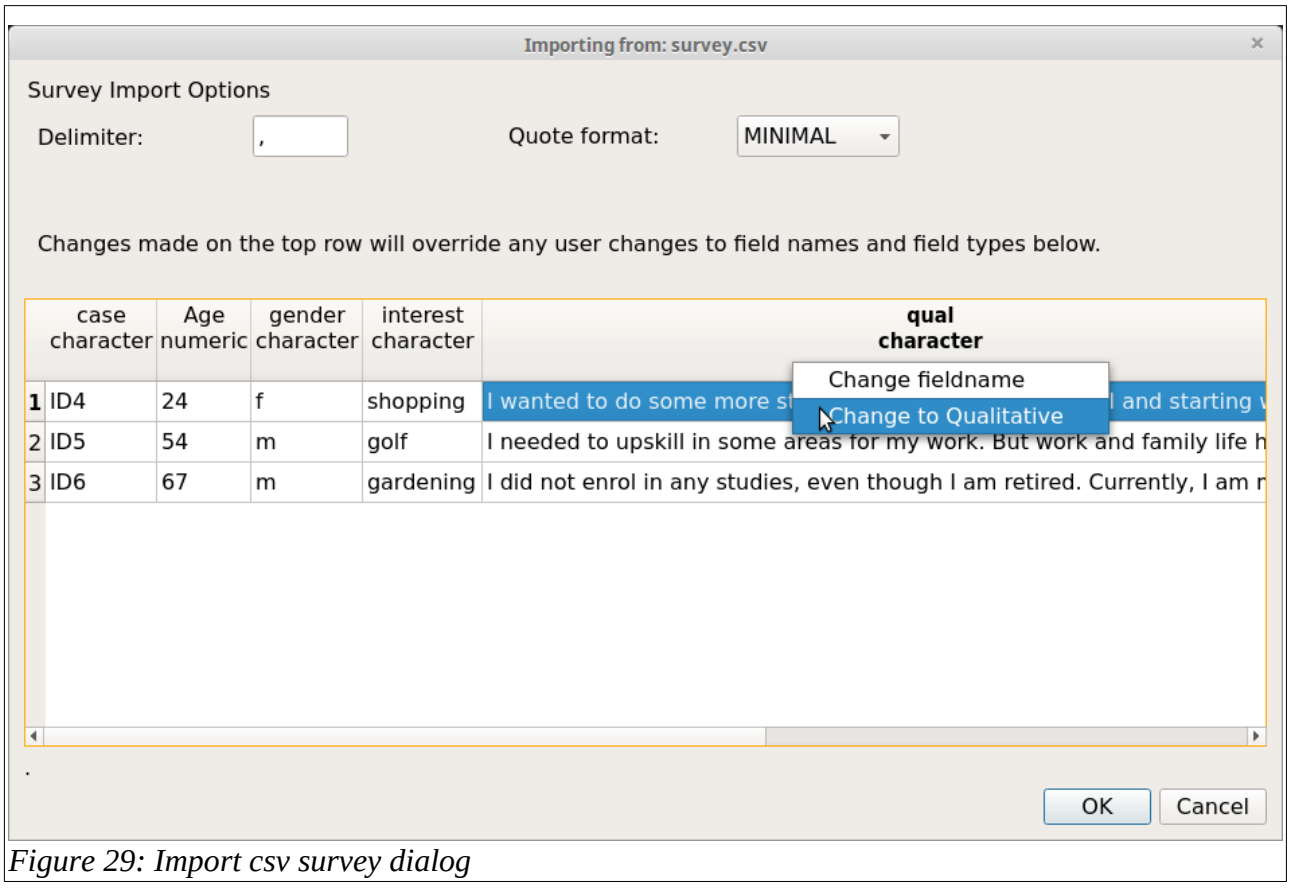

Figure 29: Import csv survey dialog

When you click on the OK button, the cases and their attributes will be added. The qualitative column will be converted to a file which will be named with the column name plus the current date and time. Each respondent's row will be prepended with [the unique id] so that you can identify each respondent. Also, the text for each respondent will be automatically linked to the corresponding case.

5.2 REFI-QDA

The Rotterdam Exchange Format Initiative (REFI) is an open standard for exporting and importing codebooks and projects from and to different computer-aided qualitative data analysis software. The website for the exchange initiative is www.qdasoftware.org

Currently, QualCoder is able to export and import a codebook.

Exportation of a project and importation of a project are experimental and do not meet the full REFI-QDA standard. Some experimentation has been performed with Nvivo and MAXQDA qdpx files.

Importation of project.qpdx files partly works, coding stripes may not correctly match text selections (sometimes may be off by a character). Importation of transcription and syncpoints is untested.

Features such as sets and graphs cannot be imported as this functionality is not within QualCoder. Other data formats are not preserved, for example attributes with date, integer, float or boolean would be converted to text data.

To import, close any currently opened project first. Then choose a new QualCoder project name, then select the qdpx import file.

If no coded data is visible, you may need to change the current coder's name in Settings. Try the drop down box.

5.3 RQDA

Projects made with RQDA (http://rqda.r-forge.r-project.org/) can be directly imported. All data except for file categories are imported.

Close any opened project. Then in the Main Menu under Project click on RQDA Project import. You will be asked to create a new project - so enter a new project name. Then you will be asked to select the RQDA project file. QualCoder will then import the data.

If no coded data is visible, you may need to change the current coder's name in Settings.

5.4 Codebook

A codebook is a list of your codes. Each code memo should detail the reasons for the purpose of each code. The codebook can be exported to a text file. The codebook also shows the frequency of the codes used (from all coders). Example codebook output is shown below. As codes and categories are put in a tree like structure the double minus ‘–‘ indicates the subordinate codes and categories within a category.

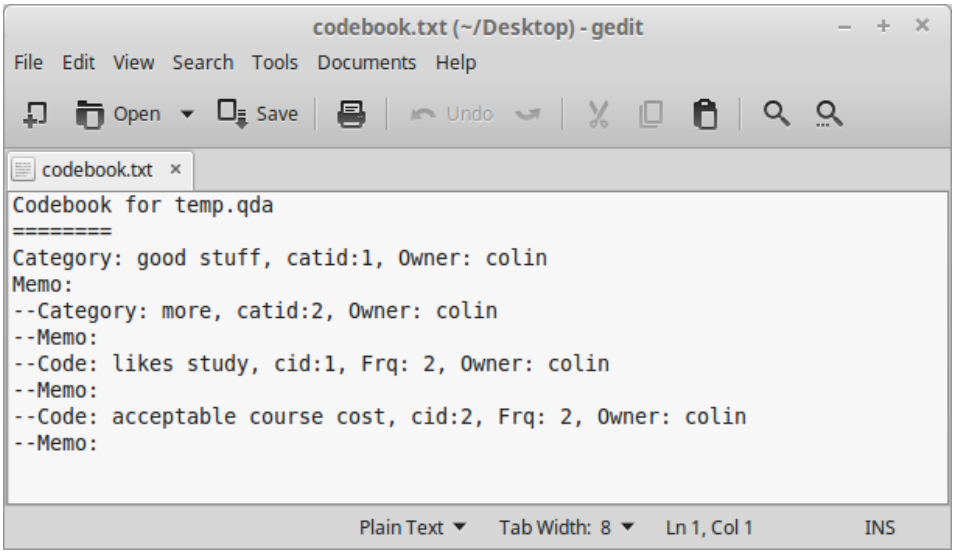

Figure 30: Codebook text file

6 Other details about QualCoder

The qda data folder contains folders for imported documents, images, audio and video. It also contains the sqlite database, named data.qda, to store coding data.

QualCoder creates QualCoder.log and config.ini and recent_projects.txt files inside a .qualcoder folder in your home directory. The config.ini file contains the name of the current coder, a default working directory, font choice and language. The log file records program errors and some user actions. There maybe several rolling log files. QualCoder is written in python 3 using Qt5 for the graphical interface.

YouTube videos in Spanish are available, thanks to Omar Bautista:

https://www.youtube.com/watch?v=D2vks2n9d1g

https://www.youtube.com/watch?v=cqAy_RJkhvY

6.1 Acknowledgements

Ronggui Huang and Zhang Gehao for creating RQDA, which inspired this software. Mike MacCana for the source code for the docx module. User: bit4 on stackoverflow who presented the source code to convert html to text. Pdfminer3k: Copyright (c) 2004-2010 Yusuke Shinyama <yusuke at cs dot nyu dot edu> ebooklib: Aleksandar Erkalović (https://github.com/aerkalov). The VideoLAN team for the bindings to VLC. To various members on github for supporting this project. Omar Bautista for creating YouTube videos.

6.2 Publications citing QualCoder

Local–global linkages: Challenges in organizing functional communities for ecosocial justice. Joel Izlar, Journal of Community Practice 27(3-4) 2019

Barriers to Health: Understanding the Barriers Faced by Community Intervention Projects. Vera Landrum, The University of Southern Mississippi 2020, Available from: https://aquila.usm.edu/cgi/viewcontent.cgi?article=1772&context=masters_theses

Framing food geographies. S Ramsay, Masters Thesis, Stockholms Universitet 2020

Seeking research software. A qualitative study of humanities scholars' information practices. Ronny Gey, Masters Thesis, Humboldt University of Berlin 2020

7 Future plans

Currently, the primary testing environment is Ubuntu 20.04 and secondly Windows 10. QualCoder has been used on Ubuntu 19.04, Linux Mint 19.04, Lubuntu 18.04, Windows 10, Raspberry Pi and MacOS.

In Windows, reports exported in ODT format are okay, but some images may overlap when the ODT file opened with Microsoft Word rather than opened with LibreOffice. There continue to be occasional issues in Windows with the software finding the VLC libvlc.dll file for audio/video work.

Further testing on different operating systems is required.

Some potential plans for the future are to add the following functionality:

General:

- Provide software in other languages for widgets and documentation. This is underway and some language options are available.
- Improve the REFI-QDA project import and export to make it standards compliant. This is gradually underway.
- Improve packaging for Linux and Windows 10

Reports:

- Possibly look at text mining functionality, word clouds, word visualisations
- Look again at the python Igraph package. (This did not load on older OS’s or older python versions)
- Possibly word counts
- Alternative ways to visualise codes

8 About the author

Hello, my name is Colin Curtain and I am a pharmacist and lecturer from Australia. I have many interests including clinical pharmacy, computer programming, research, statistics and clinical decision support. I completed a PhD evaluating computerised clinical decision support in 2014. When doing my PhD I used R as the statistics program of choice. This is where my interest in qualitative data analysis and the use of RQDA came from, which ultimately led to this project.

Originally when doing my PhD I analysed qualitative survey data via a thematic approach using RQDA. I then thought this could be reproduced in Python, so I scripted an earlier version called PyQDA which worked OK at the time.

I thought I would share QualCoder in the hope that it may help others. Bugs are possible and functionality could be further extended. I only work on the programming for this in my spare time.

If and when you use QualCoder and publish your results, I would really appreciate it if you let me know the bibliographic information of your work.