


**R QUALITATIVE DATA ANALYSIS  
(RQDA) PACKAGE:**  
A FREE QUALITATIVE DATA ANALYSIS TOOL

Learn how to import and work with  
interview data in R.



THE UNIVERSITY of NORTH CAROLINA  
**GREENSBORO**  
Department of Educational  
Research Methodology

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**Reference:**  
Huang, R. (2011). RQDA: R-based  
Qualitative Data Analysis. R  
package version 0.2-1. URL  
<http://rqda.r-forge.r-project.org/>.

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**QUALITATIVE ANALYSIS/INFORMATION**







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## MAKING SENSE OF DATA

- Helps take the place of what we used to do manually
  - Highlighters
  - Even if you have simple categories, it can get messy
    - Positive Opinion
    - Negative Opinion
      - Subcategories show up




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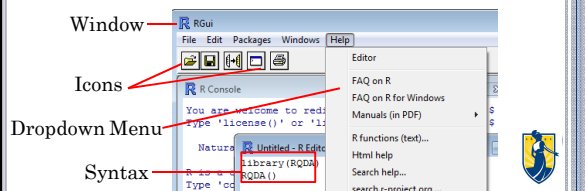
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## INTRODUCTION

- Free Package in the R platform
- Works with Windows, Mac, and Linux
- GUI Application (Graphical User Interface)
  - A graphical user interface is a visual way for you to manipulate the syntax by a mouse or keyboard.




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## INTRODUCTION

- Each package is maintained and supported by the author, but not warrantied
- “CRAN checks” report any potential notes, warnings, and errors associated with a package
- **Rule of Thumb:** Play with the R program before you work on anything professional and know your data




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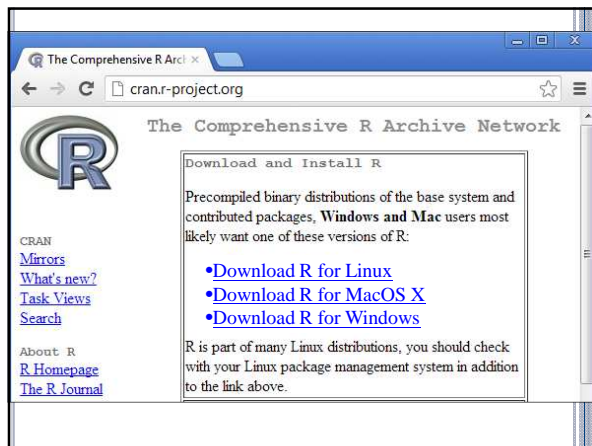
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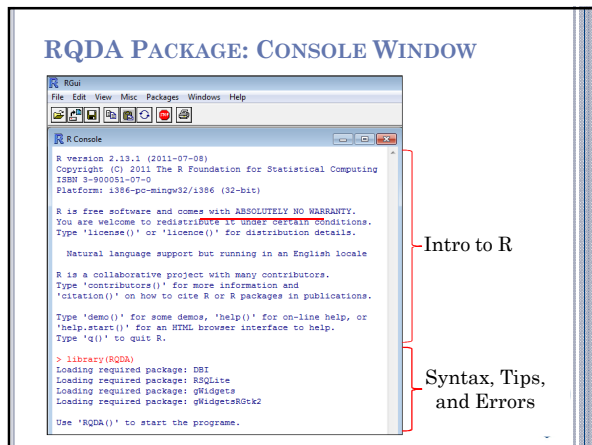
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### TIPS: INSTALLING RQDA

- Make sure to add the “dependencies=TRUE” argument when you install packages. This allows the download of all other packages that the package of interest depends on to function.

install.packages(“RQDA”, dependencies = TRUE)




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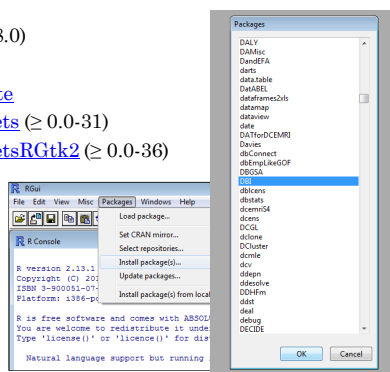
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### RQDA PACKAGE: DEPENDENCIES

- R ( $\geq 2.8.0$ )
- [DBI](#)
- [RSQLite](#)
- [gWidgets](#) ( $\geq 0.0-31$ )
- [gWidgetsRGtk2](#) ( $\geq 0.0-36$ )




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### TIPS: SET WORKING DIRECTORY

- Make sure to change your File Directory before running any packages.
- This will tell R where your files are and where to save files to.
- Manually: Go to File – Change Directory- Select Appropriate Folder
- Syntax:

```
setwd("C:/Users/Lindsey/Documents/AEA2012")
```




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## LOADING THE RQDA PACKAGE

```

RGui
File Edit Packages Windows Help

R Console
> setwd("C:/Users/Lindsey/Documents/Evaluation GA/AEA/AEA2012")
> library(RQDA)
> RQDA()
> |

Untitled - R Editor
##sets the working directory, or location of files that you
##want to open or where you want to print documents from R
setwd("C:/Users/Lindsey/Documents/Evaluation GA/AEA/AEA2012")

##Load the RQDA library
library(RQDA)

##Open the RQDA program
RQDA()

```

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## RQDA PACKAGE: ERRORS

```

RGui (32-bit)
File Edit Packages Windows Help

R Console
Type 'license()' or 'licence()' for distribution details.
Natural language support but running in an English locale
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

> utils::install.packages()
--- Please select a CRAN mirror for use in this session ---
Warning in install.packages("RQDA", libPaths()[1L], dependencies = NA, type = "s"
"lib" = "C:/Program Files/R/R-2.15.1/library" is not writable
Error in install.packages("RQDA", libPaths()[1L], dependencies = NA, type = "s"
unable to install packages
> local({pkg <- select.list(sort.packages(all.available = TRUE), graphics=TRUE)
+ if (nohar(pkg)) library(pkg, character.only=TRUE)})
> RQDA(library)
Error: could not find function "RQDA"
> RQDA()
Error: could not find function "RQDA"
> |

Untitled - R Editor
RQDA(library)
RQDA()

```

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## TIPS: UPDATING PACKAGES

- o Regularly update packages.
- o Two ways
  - Pull down menu
    - o Packages -> Update packages -> Choose Package
  - Syntax

update.packages(RQDA)




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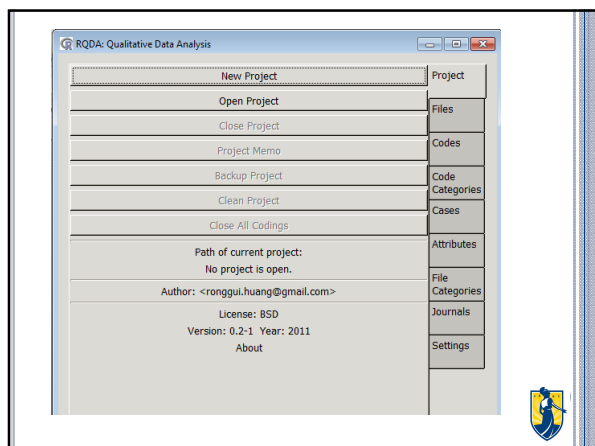
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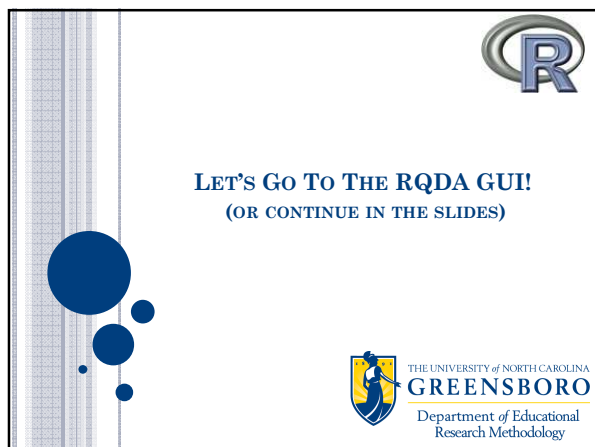
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### RQDA GUI PowerPoint Tips

- o Note: The following RQDA GUI PowerPoint slides do not provide exact instructions about how to utilize the GUI. Each slide contains a relevant screenshot that is meant to help you visualize and annotate the features of the program.

- o Screenshot Key:



Stars highlight features or notes in the image that may go unnoticed



Borders, arrows, symbols in blue indicate tips




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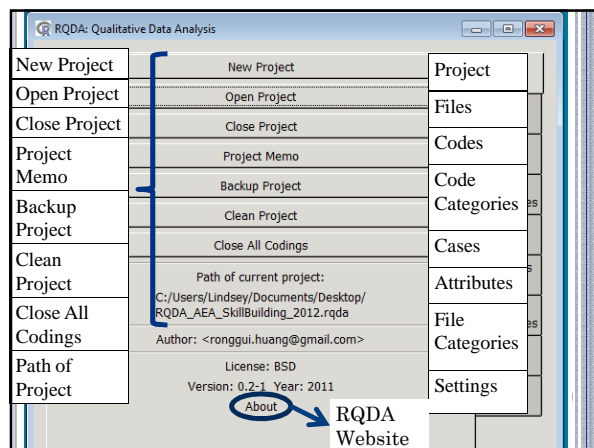
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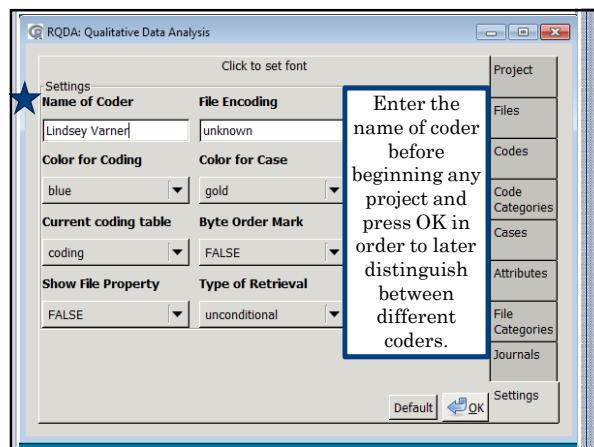
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Note: You can export coding as a .html file by right clicking on the code and scrolling to that option.

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The screenshot displays the RQDA: Qualitative Data Analysis software. The interface is divided into several sections. At the top, there's a title bar with the text 'RQDA: Qualitative Data Analysis' and standard window controls. Below this is a toolbar with buttons for 'Add', 'Delete', 'Rename', and 'Memo'. A 'Selected.category.id.is.1' field is visible. The main area is split into two panes. The left pane shows a list of codes under the heading 'Positive Outcomes', with a sub-section for 'Recommendations'. A blue star icon is placed next to the 'Plot Selected Code Categories' option in the context menu. The right pane shows a list of categories, including 'Project', 'Files', 'Codes', 'Code Categories', 'Cases', 'Attributes', 'File Categories', 'Journals', and 'Settings'. A large blue bracket on the left side of the code list points to the 'Add To' button in the context menu, indicating that codes are sorted into code categories using this button to organize the project.

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The screenshot shows the RQDA software interface. At the top, there is a menu bar with 'File', 'Edit', 'View', 'Tools', 'Help', and 'About'. Below the menu bar is a toolbar with buttons for 'Add', 'Delete', 'Rename', 'Unlink', and 'Link'. The main window is titled 'RQDA: Qualitative Data Analysis'. It contains a list of cases on the left and a list of attributes on the right. The cases list includes 'Participant1', 'Participant6', and 'Participant7'. The attributes list includes 'Project', 'Files', 'Codes', 'Code Categories', 'Cases', 'Attributes', 'File Categories', 'Journals', and 'Settings'. A blue box highlights the 'Add' button and the 'Link' button, with a text overlay that reads: 'Highlight a case, select a file and press the link button to assign a case to a file. Then you can assign attributes to cases.'

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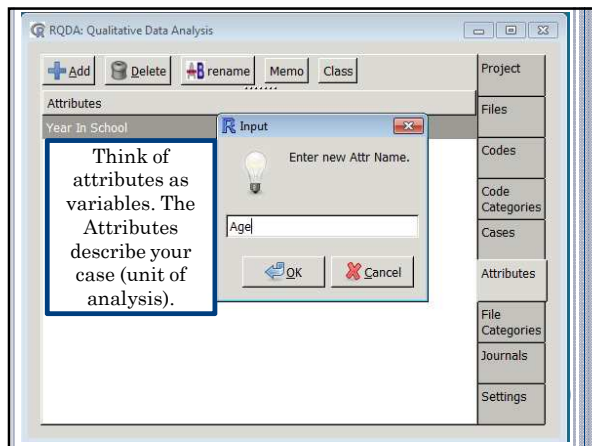
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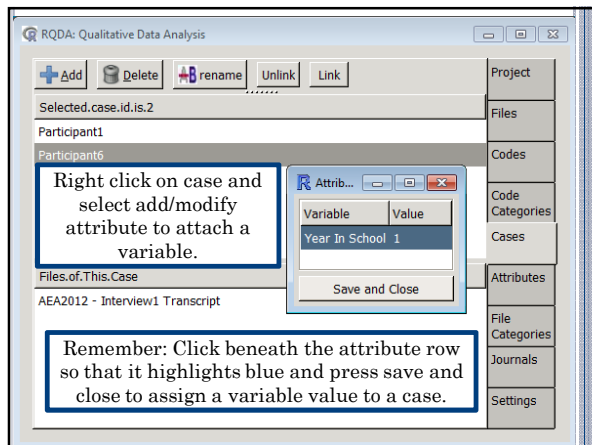
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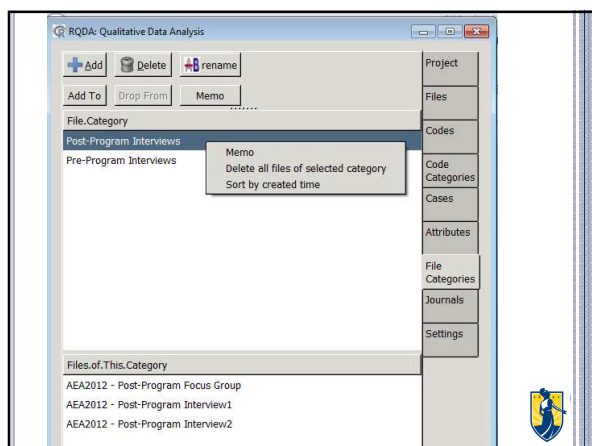
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### ACTIVITY 1

- Open the project provided in the AEA Public eLibrary
- Code text in one of the interview files provided
- Attach an attribute to a case
- Feel free to play with any of the other GUI features and ask questions!




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### CODINGBYSEARCH()

- This function searches the specified file for a given string and applies a designated coding.
- Before:
  - Q2 – What happens in typical session
    - It was pretty consistent, she would make notes of what we talked about that day and then we would start by her asking me how certain things like my goals were attained that week, then we would talk about the group session and how I could apply it to me. Then we would discuss
- Run
 

```
codingBySearch("goals",fid=getFileIds(),cid=9,
seperator="[.!?]")
```
- After:
  - Q2 – What happens in typical session
    - goals** It was pretty consistent, she would make notes of what we talked about that day and then we would start by her asking me how certain things like my goals were attained that week, then we would talk about the group session and how I could apply it to me. Then we would

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### CODINGBYSEARCH()

String to  
search the  
file for

Gets the  
file IDs  
from the  
project

Attributes this  
code to the  
sentence  
containing the  
designated  
string

- `codingBySearch("goals",fid=getFileIds(),cid=9,seperator="[.!?]")`

Tells the function to stop  
the coding when it  
encounters a ".", "!", or "?"  
(basically at the end of the  
sentence)

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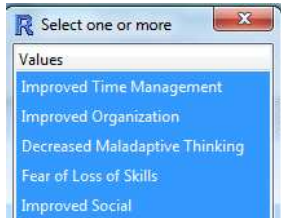
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**CROSSCODES()**

- This function returns a matrix summarizing the relation between codes.
- You can specify the type of relation as inclusion, overlap, proximity, or exact.
- Run crossCodes() to bring up this window and select the relevant codes




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**CROSSCODES()**

- Example output of crossCodes(relation="inclusion")
  - Remember to put the relation type in quotations.

```
> crossCodes(relation="inclusion")
      1 2 4 3 6 5
Improved Time Management(1) 0 0 0 0 0 0
Improved Organization(2)    0 0 0 0 0 0
Decreased Maladaptive Thinking(4) 0 0 0 0
Fear of Loss of Skills(3)      0 0 0
Improved Social(6)             0 1
```

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**EXPORTCODEDFILE()**

- This function exports a coded file in the format of an HTML file with codings and labels.
- Takes the form of...

Name of  
exported file

Specify the file  
from which to  
create the HTML

Closes the  
file so we can  
open it

- exportCodedFile(file, fid, closeAfter = TRUE)
- Example:
  - exportCodedFile("exported\_file.html", fid = `closeAfter = TRUE)

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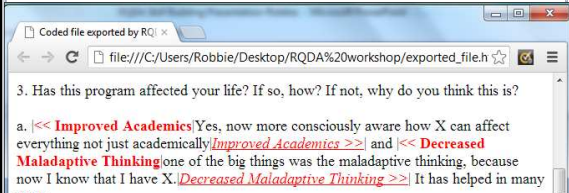
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**EXPORTCODEDFILE()**

- The result is an HTML file of the coded file...



- Bold code names preceded by '<<' mark the beginning of a coded section and italicized code names succeeded by '>>' mark the end of the section.

**FILESBYCODES()**

- This function returns which files contain which codes.
- Simply running filesByCodes() will output a table to the R window with each file as a row and each coding as a column, with a 1 in the cell if the file contained the code and a 0 otherwise.
- filesByCodes() produces the output:

**FILESBYCODES()**

fid	filename	codedBy.Improved Time Management	
1	2 AEA2012 - Interview1 Transcript	1	
7	3 AEA2012 - Interview2 Transcript	0	
8	4 AEA2012 - Focus Group Transcript	1	
	codedBy.Improved Organization	codedBy.Decreased Maladaptive Thinking	
1	1	1	
7	0	1	
8	1	1	
	codedBy.Fear of Loss of Skills	codedBy.Improved Social	codedBy.Improve
1	1	0	
7	0	0	
8	1	1	

### FILESBYCODES()

- We can assign the output to an object, then create a .csv file from the object.
- .csv files can be easily viewed in excel.
- This changes our code to:

- `files_by_codes<-filesByCodes()`
- `write.csv(files_by_codes,"Files by Codes.csv")`

Assigns the created table to the object "files\_by\_codes"

Writes a .csv file of the table

### FILESBYCODES()

- The result is much easier to read:

	A	B	C	D
1	fid	filename	codedBy.Improved Time Management	codedBy.Improved Organization
2	2	AEA2012 - Interview1 Transcript	1	1
3	3	AEA2012 - Interview2 Transcript	0	0
4	4	AEA2012 - Focus Group Transcript	1	1
5				

### DELETION FAMILY OF FUNCTIONS

- When you delete something using the RQDA GUI it is really only temporarily deleted.
- Functions that can perform operations on the deleted items include:
  - `list.deleted()`
    - Lists the temporarily deleted data.
  - `pdelete()`
    - Permanently deletes data.
  - `CleanProject()`
    - Cleans the RQDA project (easily done in the GUI).
  - `undelete()`
    - Removes the temporary deletion mark on data. This can be a file, code, etc.

### ACTIVITY 2

- Go to the syntax in the R program and try to run some of the code
- Now try to change one of the objects in a code to produce different results
- Feel free to play with any of the functions in the syntax and ask questions!




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### OTHER PACKAGES AND FUNCTIONS

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### OTHER USEFUL FUNCTIONS

- Plots and Graphics
  - Plot Codes
  - Graph Gallery
- Qualitative Comparative Analysis
- Discourse analysis
- Latent Semantic Analysis
  - lsa
- Text mining
  - tm




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### PLOT CODE CATEGORIES

- For multiple code categories, you can plot them to see the organization of codes.
- Useful especially for determining any overlap.
- Highlight the code categories that you want to plot (you can select all).
- Right click on the categories and select the "Plot Category" option.




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### GO TO CODE CATEGORIES IN RQDA GUI

- Let's try this now.




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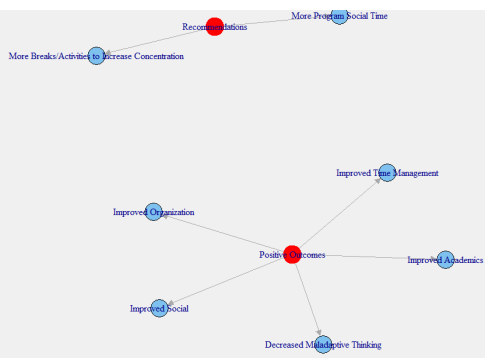
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### OUR CODES AND CATEGORIES




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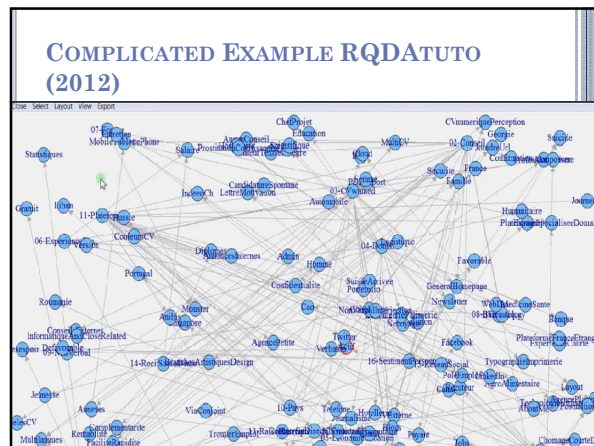
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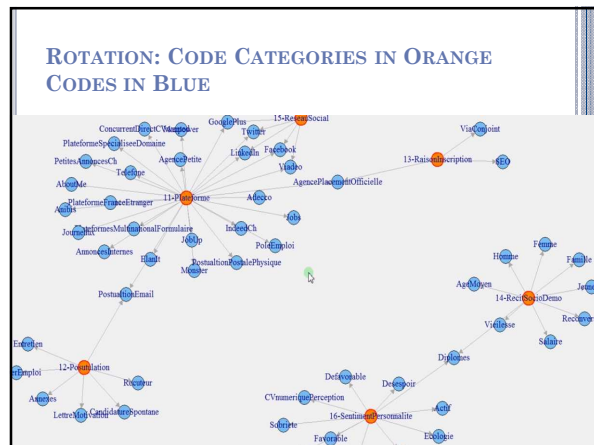
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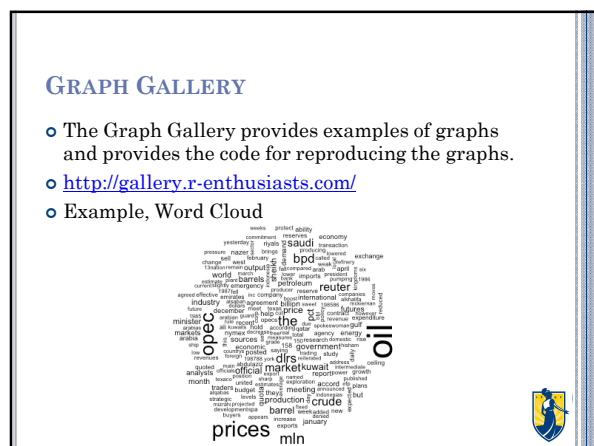
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### PLOTS AND GRAPHS

- You can do plots, graphical applications, graphic systems, and interactive graphs
- For more, visit Graphical Displays and Plots
  - Lists important packages for data visualizations
  - <http://cran.r-project.org/web/views/Graphics.html>




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### QUALITATIVE COMPARATIVE ANALYSIS (QCA)

- Developed by Charles Ragin (1987)
- Formal methods for analyzing characteristics of qualitative data.
- Study causality in binary and ordinal variables with small sample sizes.
- Potential for use with RQDA
  - Works with the cases where you assign attributes
  - Exported attributes are used as data set in QCA
  - Analyses maximize the number of comparisons that are made across the cases




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### PURPOSE OF QCA (RIHOUX, 2006)

- Summarize data
  - Describe cases
  - Visual displays
- Check coherence within the data
  - Look for contradictions
  - Learn more about individual cases
- Test existing theories and/or assumptions
  - Corroborate or refute
- Test new ideas and/or assumptions
  - Data exploration
- Analytic Induction




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### WHAT CAN YOU DO WITH QCA?

- Compare attributes of individual cases, files, or codes
  - Cases looks at attribute comparisons of individuals
    - Distribution of demographics in data set
  - Files looks at attributes comparisons of context of data collection
    - Example: type of interview (face to face vs. online)
  - Codes looks at attribute comparisons of coded text
    - Example: Positive vs. negative outcomes




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### QCA IN R

- Download the QCAGUI package. It will also connect to the QCA package
  - `install.packages("QCAGUI", dependencies = TRUE)`

- For help see manual:

Dusa, A. (2007). User manual for the QCA (GUI) package in R. URL <http://rqda.r-forge.r-project.org/>.




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### STEPS

1. In the RQDA GUI Highlight all attributes you want to use
2. Go to script file. Enter the following command:  
`Attribute <- getAttr("case")`
3. Save attribute file with the following command:  
`saveattribute <- write.table(Attribute, "saveattribute.txt")`
4. Open the QCA GUI
5. Import Data under Data tab




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### QCA – IMPORT DATA

- This is where you bring in your attribute file

- You can also open data in the QCAGUI package to practice working with the software.
  - Under “Data in Packages”
    - “read data set from an attached package”

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### QCA – GRAPHICAL FEATURES

- Program features include:
  - Histograms
  - Bar charts
  - Scatterplots and scatterplot matrices

Bar Chart Example:

ACCES	Frequency
0	13
1	11

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## HELPFUL QCA RESOURCES

- Ledermann, S. (2012). Exploring the necessary conditions for evaluation use in program change. *American Journal of Evaluation*, 33(2), 159-178.
- Marshall, G. (1998). Qualitative comparative analysis. *A Dictionary of Sociology*. Retrieved October 19, 2012 from Encyclopedia.com: <http://www.encyclopedia.com/doc/1Q88-qualitativecomparativelvss.html>
- Ragin, C.C. (1987). *The comparative method: Moving beyond qualitative and quantitative strategies*. Berkeley: University of California Press.
- Ragin, C.C. (2000). *Fuzzy-set social science*. Chicago, IL: Chicago University Press.
- Rihoux, B. (2006). Comparative methods: Recent advances and remaining challenges for social science research. *International Sociology*, 21(5), 679-706.
- Rohwer, G. (2011). Qualitative comparative analysis: A discussion of interpretation. *European Sociological Review*, 27(6), 728-740.
- Skaaning, S.E. (2011). Assessing the robustness of crisp-set and fuzzy-set QCA results. *Sociological Methods Research*, 40(2), 391-408.



## DISCOURSE ANALYSIS

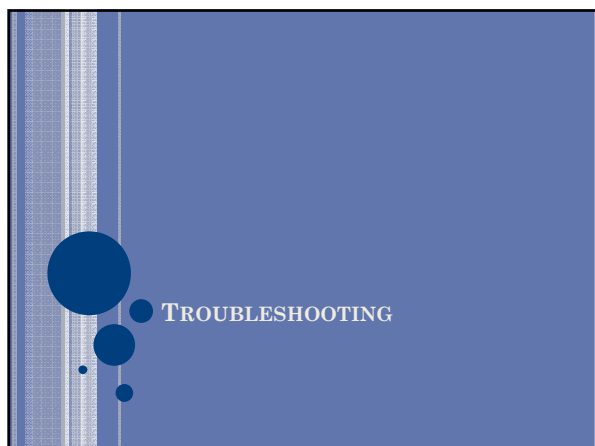
- Qdap package in production
- Will “act as a bridge between qualitative transcripts of dialogue and statistical analysis and visualization”
- <http://trinkerrstuff.wordpress.com/qdap/>



## LSA AND TM

- Latent Semantic Analysis (package lsa)
  - Similar to Factor Analysis but with text
  - Assumes that text has a higher order structure that is obscured by word usage
  - To learn more see: [http://dspacelarningnetworks.org/bitstream/1820/966/14/2007-03-29\\_lsatel-2007\\_package.pdf](http://dspacelarningnetworks.org/bitstream/1820/966/14/2007-03-29_lsatel-2007_package.pdf)
- Text Mining (package tm)
  - To manage text documents in a database and manipulating mechanisms such as whitespace removal, stemming, or stopword deletion.
  - To learn more see: <http://cran.r-project.org/web/packages/tm/vignettes/tm.pdf>






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### ERROR MESSAGES

- Always check the R Console screen for error messages.
- Example of Error after not properly installing QCA package:  
Error in library(QCA3) : there is no package called 'QCA3'
- You can do a Google search of some errors to help find solutions




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### HELP PAGE

#### Three Ways to Access Help:

- Enter ? Before the help page of the function you want more information on
  - ?plot
- Enter () after package
  - QCAGUI()
- Help pages for functions frequently used in syntax
  - help(package="RQDA")




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## OTHER RESOURCES

- **RSeek meta search engine:** <http://www.rseek.org/>  
The RSeek meta search engine, provides a unified interface for searching the various sources of online R information. If an answer to your question is already available online, RSeek can help you locate it.
- **Stack Overflow:** <http://stackoverflow.com/questions/tagged/r>  
The R tag on Stack Overflow is becoming an increasingly important resource for seeking answers to R related questions. You can search the R tag in general, or refine your search to another tag such as ggplot2 or sweave.
- **R-help mailing list:** <https://stat.ethz.ch/mailman/listinfo/r-help>  
**R-help list archives:** <http://tolstoy.newcastle.edu.au/R/>  
The R-help mailing list is a very active list with questions and answers about problems and solutions using R. Before posting to the list, it is recommended to search the list archives to see if an answer already exists.

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## ANY QUESTIONS?

- RQDA GUI
- RQDA Syntax
- Plots
- QCA
- Troubleshooting

Please contact any of the authors of this presentation listed below for further information.

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