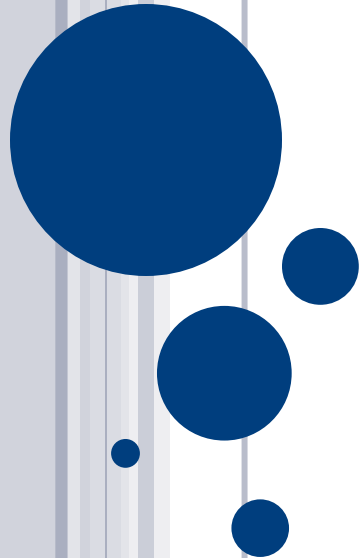# R Qualitative Data Analysis (RQDA) Package:
A free qualitative data analysis tool

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/.
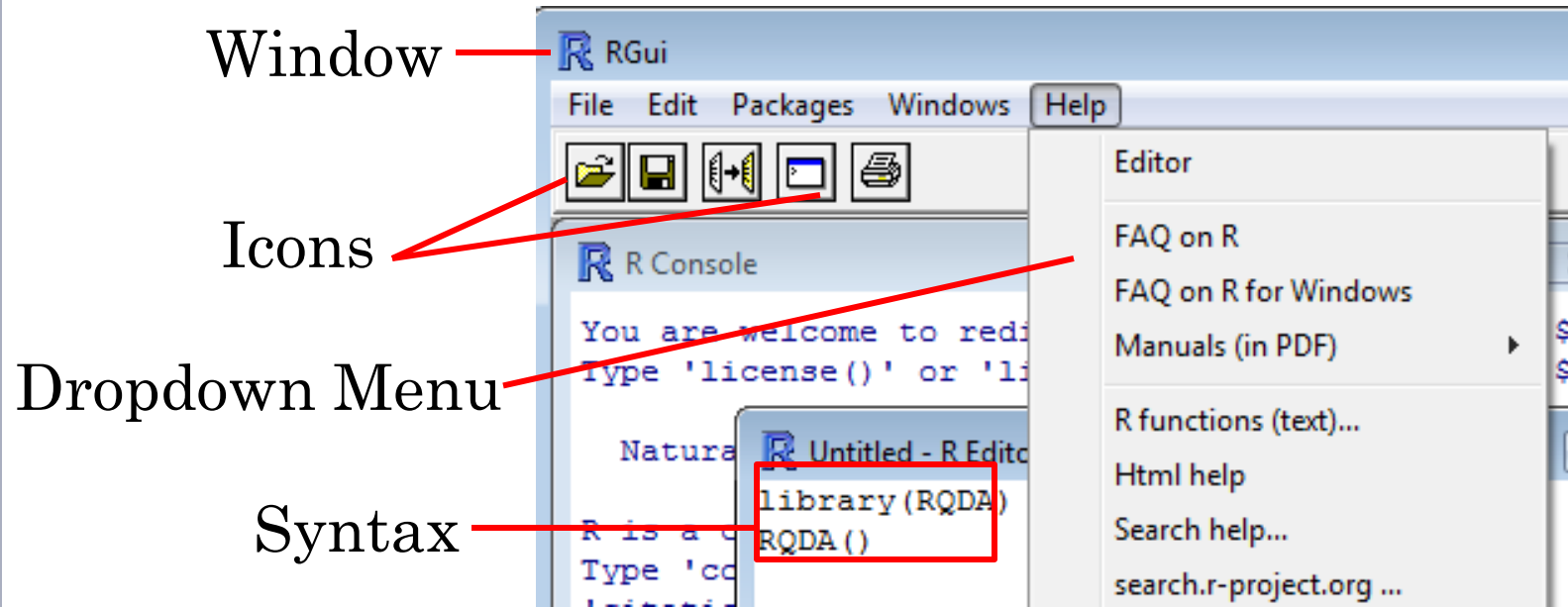
Qualitative Analysis/Information

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

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.

Window

Icons

Dropdown Menu

Syntax

R RGui

File   Edit   Packages   Windows   Help

Editor

R R Console

You are welcome to redi
Type 'license()' or 'li

Natura

R Untitled - R Edito

library(RQDA)

R is a
Type 'co

RQDA()

FAQ on R
FAQ on R for Windows
Manuals (in PDF)

R functions (text)...
Html help
Search help...
search.r-project.org ...

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

cran.r-project.org

The Comprehensive R Archive Network

Download and Install R

Precompiled binary distributions of the base system and contributed packages, **Windows and Mac** users most likely want one of these versions of R:

- Download R for Linux
- Download R for MacOS X
- Download R for Windows

R is part of many Linux distributions, you should check with your Linux package management system in addition to the link above.
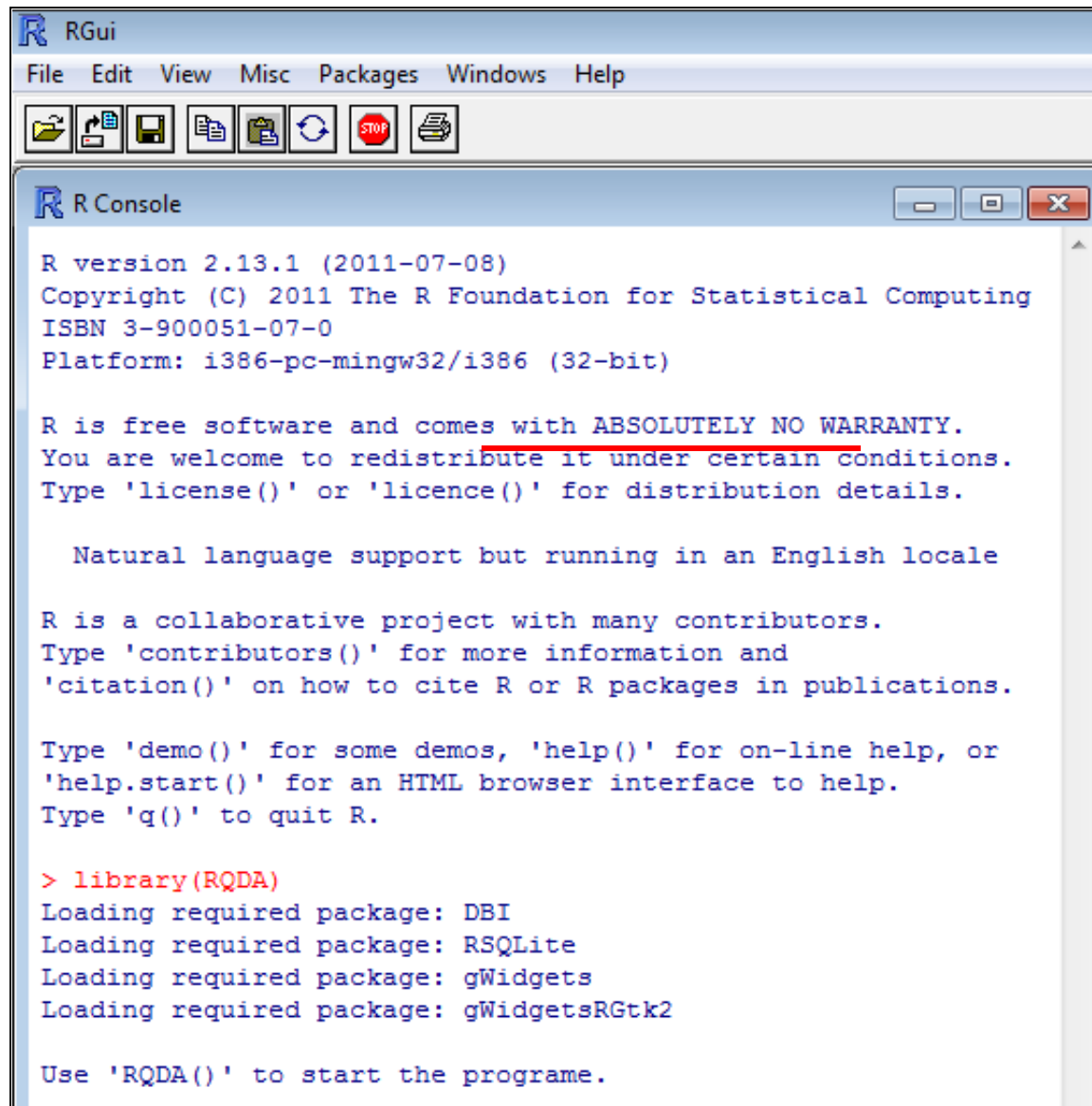
CRAN

Mirrors

What's new?

Task Views

Search

About R

R Homepage

The R Journal

RQDA Package: Console Window

R version 2.13.1 (2011-07-08)
Copyright (C) 2011 The R Foundation for Statistical Computing
ISBN 3-900051-07-0
Platform: i386-pc-mingw32/i386 (32-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
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.

> library(RQDA)
Loading required package: DBI
Loading required package: RSQLite
Loading required package: gWidgets
Loading required package: gWidgetsRGtk2

Use 'RQDA()' to start the programe.

Intro to R

Syntax, Tips, and Errors

Installation

- **Step one**, Install GTK+ (because RGtk2 depends on GTK+, you need to install it before install RGtk2). For windows user, download GTK+ and install it. For Mac OSX users, go to here to download and install GTK+. For Debian-based Linux users, you may use *sudo apt-get install libgtk2.0-dev* to install GTK+ developer library. In Fedora use *yum install -y gtk2-devel* to install. For other Linux users, you may have to manually install GTK+, download the source tarball, and follow the instructions of installation. You can refer to this page for installation of RGtk2.
- **Step two**, Install R. Go to CRAN, download R and install it. For Linux and BSD users, you can download binary version of R or the source code. For Windows users, you can download the binary version of R from the download page. For Mac OSX users, download the binary version of R from the download page. More instructions about installing R are in the R Installation and Administration Manual.
- **Step three**, Launch R for further installation. It can be launched as a normal application in Windows, or by command *R* within a shell terminal in Linux and FreeBSD. Then, you can see the prompt ">", which indicates that R is ready for further commands.
- **Step four**, Install relevant R packages by command: *install.packages("RQDA",dependencies=c("Depends", "Imports"))* . If you want to use the developer version of RQDA, you can use this command after you have installed RQDA by using the command: *install.packages("RQDA",repos=" http://R-Forge.R-project.org")*.
- **Step five**, Launch RQDA using command *library(RQDA)* from within R. Then you can see the RQDA GUI.
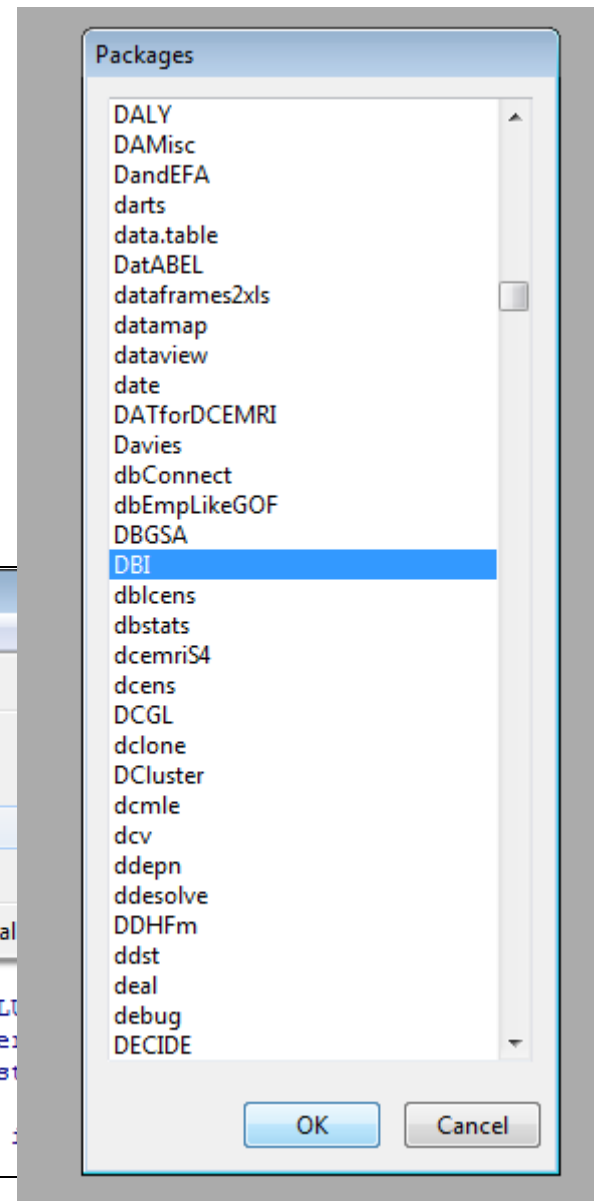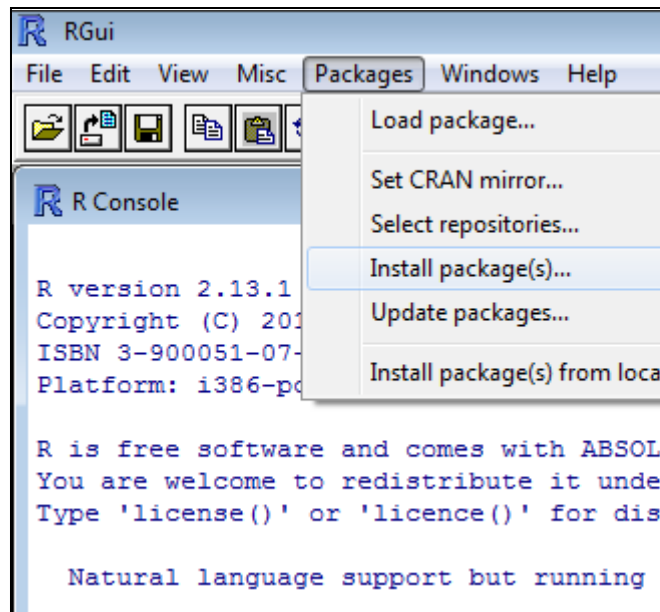
TIPS: INSTALLING RQDA

- 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)

RQDA PACKAGE: DEPENDENCIES

- R (≥ 2.8.0)
- DBI
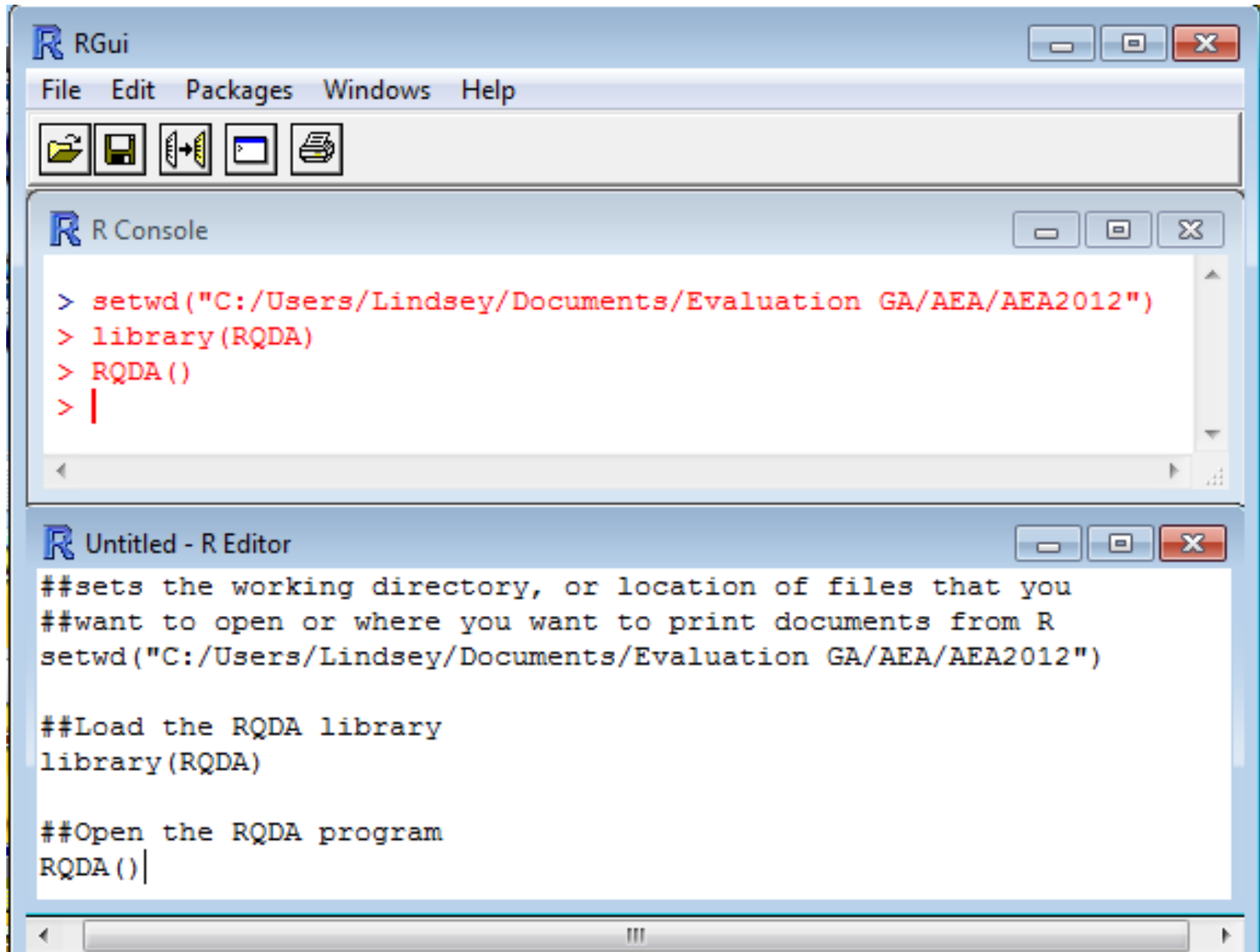- RSQLite
- gWidgets (≥ 0.0-31)
- gWidgetsRGtk2 (≥ 0.0-36)

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.
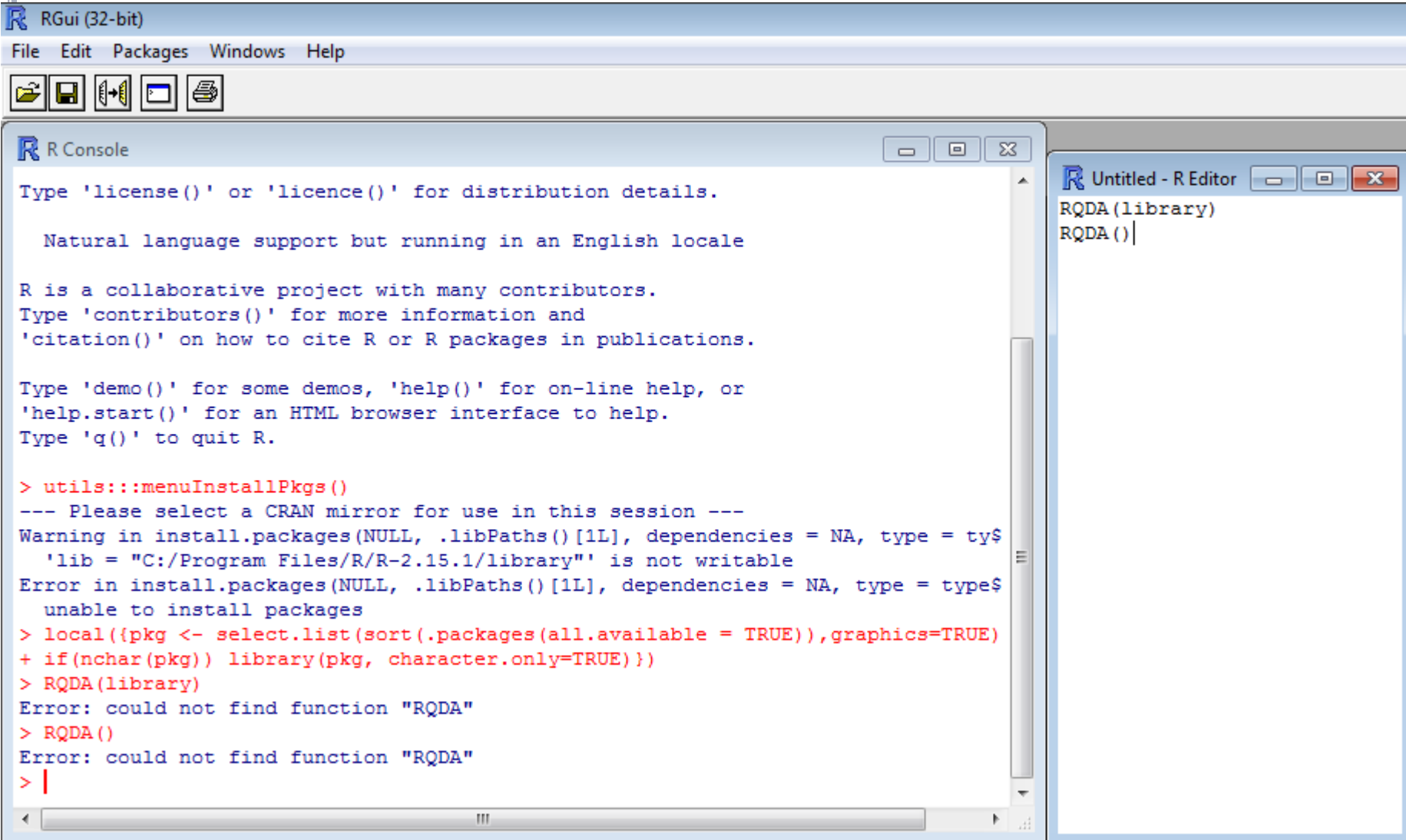- Manually: Go to File – Change Directory- Select Appropriate Folder
- Syntax:

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

LOADING THE RQDA PACKAGE

RQDA PACKAGE: ERRORS

TIPS: UPDATING PACKAGES

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

update.packages(RQDA)

LET'S GO TO THE RQDA GUI!
(OR CONTINUE IN THE SLIDES)

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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

RQDA: Qualitative Data Analysis

New Project	New Project	Project
Open Project	Open Project	Files
Close Project	Close Project	Codes
Project Memo	Project Memo	Code Categories
Backup Project	Backup Project	
Clean Project	Clean Project	Cases
Close All Codings	Close All Codings	Attributes
Path of Project	Path of current project: C:/Users/Lindsey/Documents/Desktop/ RQDA_AEA_SkillBuilding_2012.rqda	File Categories

Author: <ronggui.huang@gmail.com>

License: BSD

Version: 0.2-1 Year: 2011

About → RQDA Website

Settings

RQDA: Qualitative Data Analysis
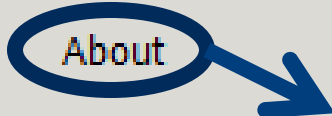
Click to set font

Settings

Name of Coder

Lindsey Varner

File Encoding

unknown

Color for Coding

blue

Color for Case

gold

Current coding table

coding

Byte Order Mark

FALSE

Show File Property

FALSE

Type of Retrieval

unconditional

Enter the name of coder before beginning any project and press OK in order to later distinguish between different coders.

Project

Files

Codes

Code Categories

Cases

Attributes

File Categories

Journals

Settings

Default | OK

Temporary Delete

RQDA: Qualitative Data A...

Import | New | Delete | Open | Memo | rename | Attribute

Project

Selected.File.id.is.2

Files

AEA2012 - Focus Group Transcript

AEA2012 - Interview1 Transcript

AEA2012 - Interview2 Transcript

Codes

Search a word

encourage

Search

Code Categories

Cases

AEA2012 - Interview1 Transcript

The set up of the session was a private room, and I guess her role would be more of like a coach and make sure everything was good in my life and just `encourage` me to get more involved like if I needed you know services that the school offered or to stop the maladaptive thinking behavior and things like that, you

Attributes

File Categories

Journals

Settings

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

RQDA: Qualitative Data Analysis

Add | Delete | rename | Memo

Anno | Coding | Unmark | Mark

Project | Files | Codes | Code Categories | Cases | Attributes | File Categories | Journals | Settings

Selected.code.id.is.4

Decreased Maladaptive Thinking

Fear of Loss of Skills

Improved Academics

7 Retrieved codings: "Decreased Maladaptive Thinking" f...

AEA2012 - Focus Group Transcript [2883:3093]Back
The program now helped me to not be ashamed nor am I embarrassed to tell people I have it. I learned that I had an "all-or-nothing" thinking pattern, which I learned how to take other directions in my thinking.

Annotation

Save Annotation

You can annotate by selecting text and pressing the "Anno button." Also, clicking on the "Back" button within the coding file above will return you to the place in the file from which the text segment comes.

RQDA: Qualitative Data Analysis

					Project
➕ Add	🗑 Delete	🔤 rename	Memo		
Add To	Drop From	Unmark	Mark		Files

Selected.category.id.is.1

Positive Outcomes

Recommendations

Add New Code to Selected Category	
Memo	
Plot Selected Code Categories	
Sort by created time	

Codes.of.This.Category

Decreased Maladaptive Thinking

Improved Academics

Improved Organization

Improved Social

Improved Time Management

Codes sorted into Code Categories using the "Add To" button to organize the project.

Codes

Code Categories

Cases

Attributes

File Categories

Journals

Settings

RQDA: Qualitative Data Analysis

Add | Delete | rename | Unlink | Link
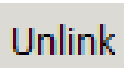
Project

Files

Selected.case.id.is.2

Participant1

Participant6

Participant7

Codes

Code Categories

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.

Cases

AEA2012 - Interview1 Transcript

Post-Participation Interview1

Interviewee: P6

Date: 99-99-9999

Time: 99:99 AM

Interviewer/Recorder: C

Attributes

File Categories

Journals

Settings

RQDA: Qualitative Data Analysis

+Add | **Delete** | **AB rename** | Memo | Class

Project

Attributes

Files

Year In School

Think of
attributes as
variables. The
Attributes
describe your
case (unit of
analysis).

Input

Enter new Attr Name.

Age

OK | Cancel

Codes

Code
Categories

Cases

Attributes

File
Categories

Journals

Settings

RQDA: Qualitative Data Analysis

Add | Delete | rename | Unlink | Link

Project | Files | Codes | Code Categories | Cases | Attributes | File Categories | Journals | Settings

Selected.case.id.is.2

Participant1

Participant6

Right click on case and select add/modify attribute to attach a variable.

Attrib...

Variable	Value
Year In School	1

Save and Close

Files.of.This.Case

AEA2012 - Interview1 Transcript

Remember: Click beneath the attribute row so that it highlights blue and press save and close to assign a variable value to a case.

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!

CODINGBYSEARCH()

- This function searches the specified file for a given string and applies a designated coding.
- Before:

  2. Q2 – What happens in typical session

  a. 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:

  2. Q2 – What happens in typical session

  a. <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

CODINGBYSEARCH()

Attributes this code to the sentence containing the designated string

Gets the file IDs from the project

String to search the file for

- 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)

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
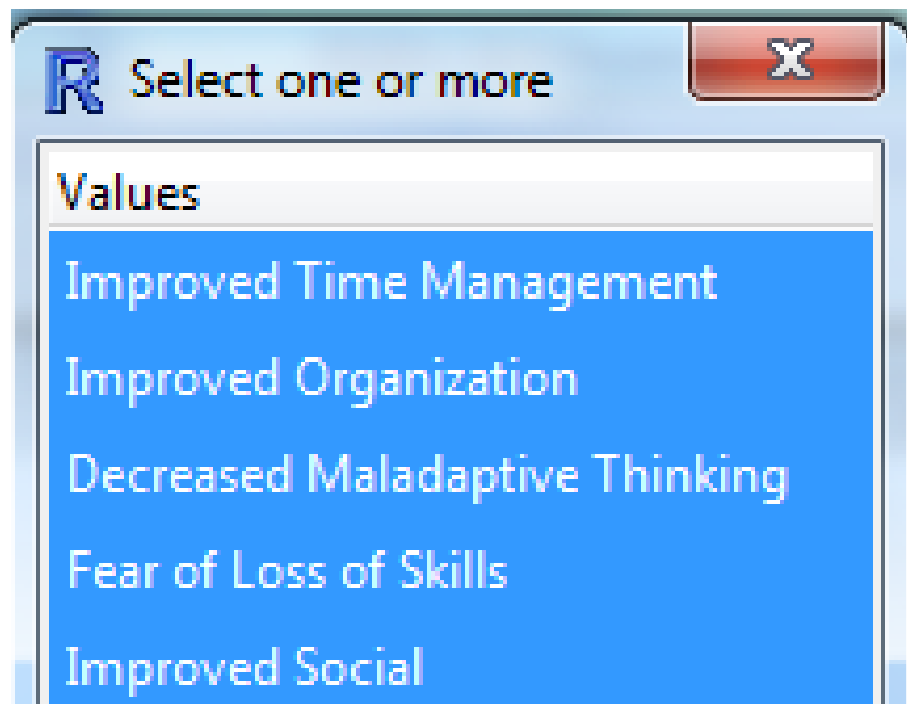
CROSSCODES()

- 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
Decreased Maladaptive Thinking(4)         0 0 0 0
Fear of Loss of Skills(3)                   0 0 0
Improved Social(6)                            0 1
```

EXPORTCODEDFILE()

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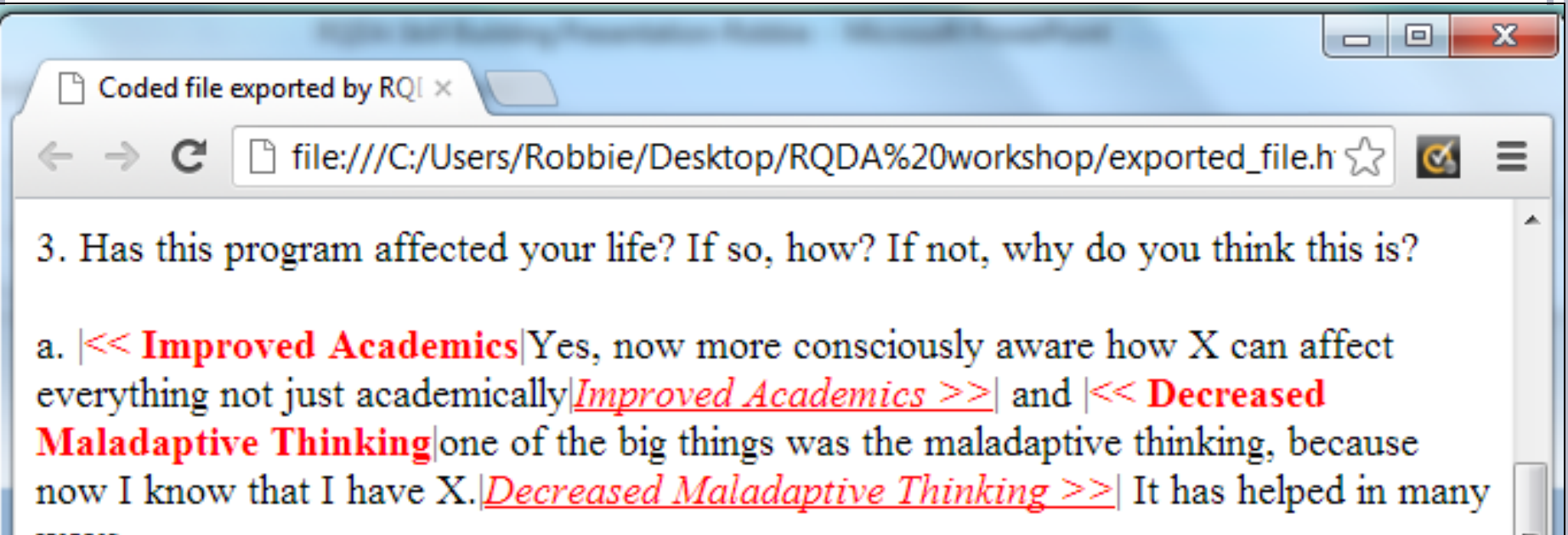
Name of exported file

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)

EXPORTCODEDFILE()

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

Coded file exported by RQI ×

file:///C:/Users/Robbie/Desktop/RQDA%20workshop/exported_file.h

3. Has this program affected your life? If so, how? If not, why do you think this is?

a. |<< **Improved Academics**|Yes, now more consciously aware how X can affect everything not just academically|*Improved Academics >>*| and |<< **Decreased Maladaptive Thinking**|one of the big things was the maladaptive thinking, because now I know that I have X.|*Decreased Maladaptive Thinking >>*| It has helped in many

- 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, the create a .csv file from the object.

- .csv files can be easily viewed in excel.

- This changes our code to:

Assigns the created table to the object "files_by_codes"

- files_by_codes<-filesByCodes()

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

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!

Other packages and functions

OTHER USEFUL FUNCTIONS

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

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).

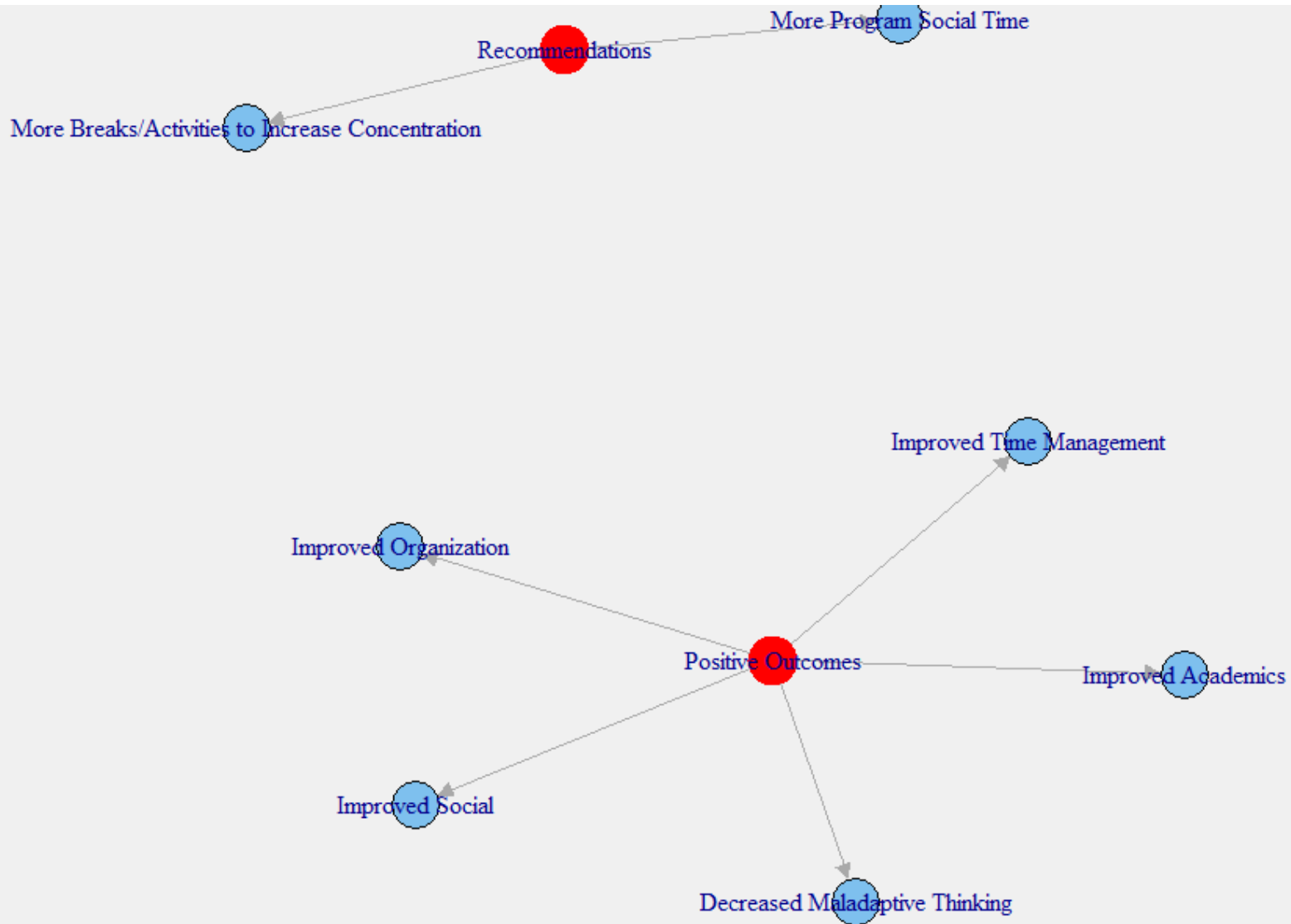- Right click on the categories and select the "Plot Category" option.

Go to Code Categories in RQDA GUI
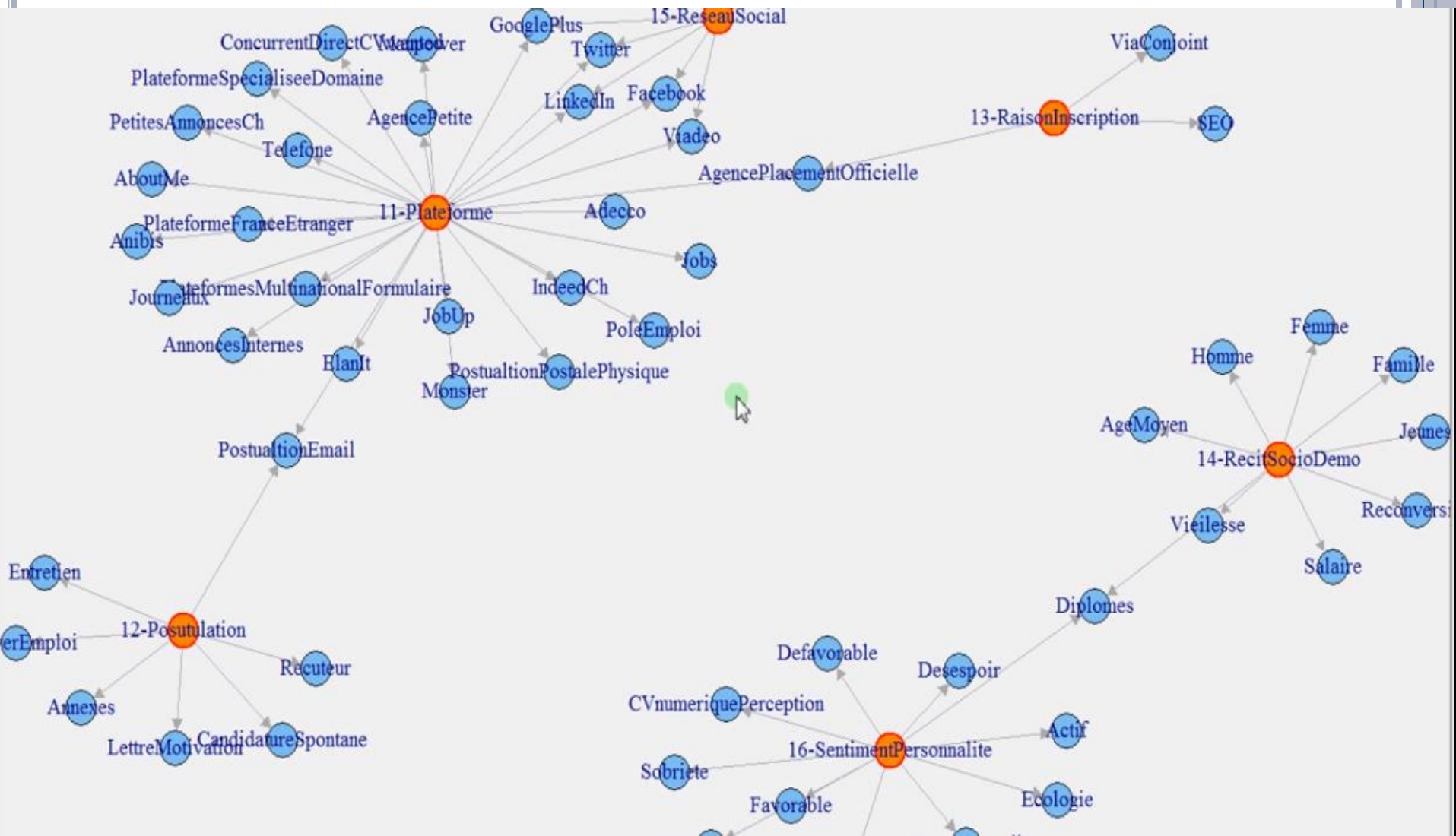
- Let's try this now.

OUR CODES AND CATEGORIES

COMPLICATED EXAMPLE RQDAtuto (2012)

GRAPH GALLERY

- The Graph Gallery provides examples of graphs and provides the code for reproducing the graphs.

- http://gallery.r-enthusiasts.com/

- Example, Word Cloud

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

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

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

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

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/.
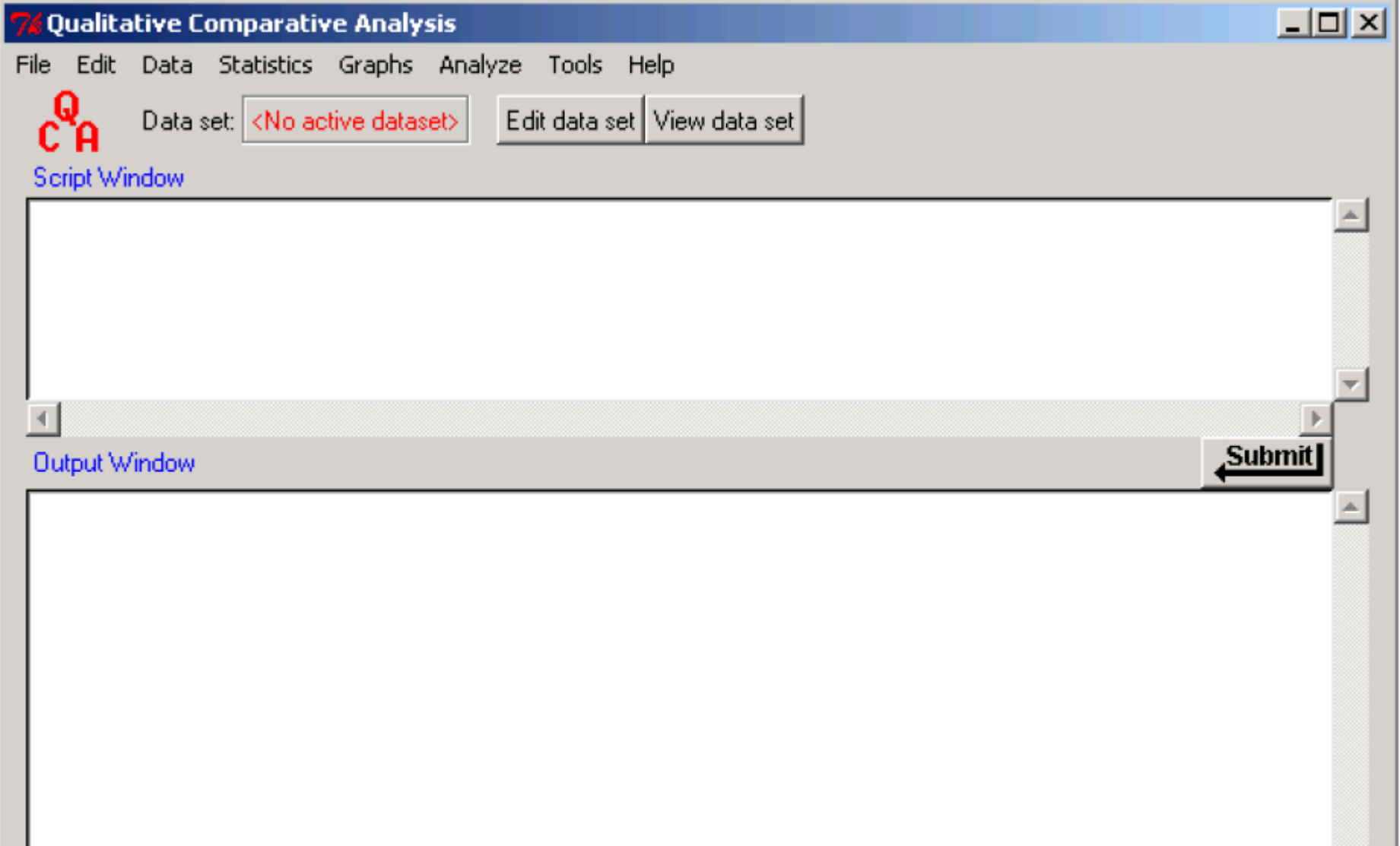
STEPS

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
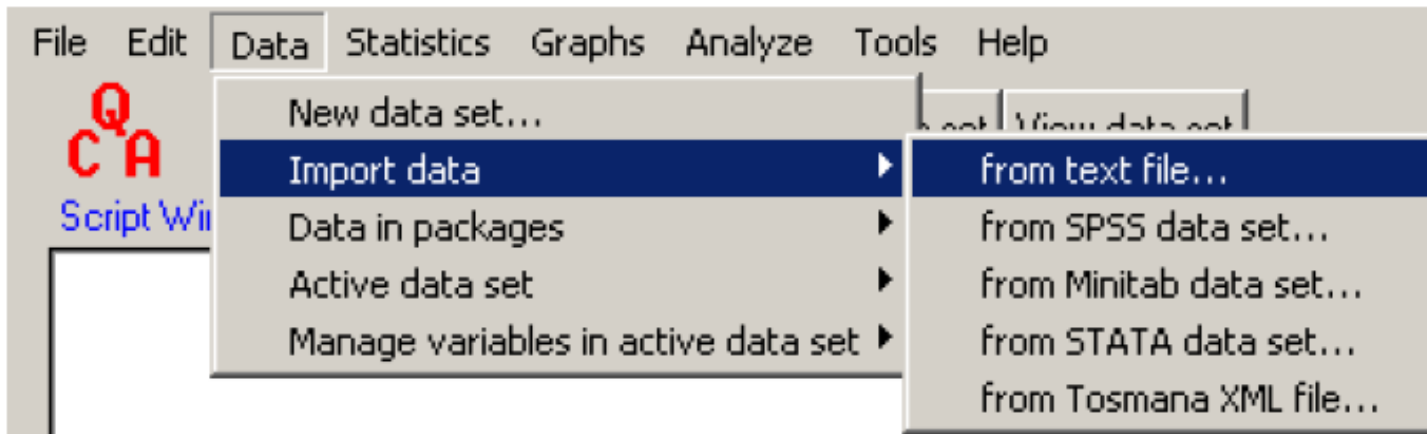
5. Import Data under Data tab

QCA GUI

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"
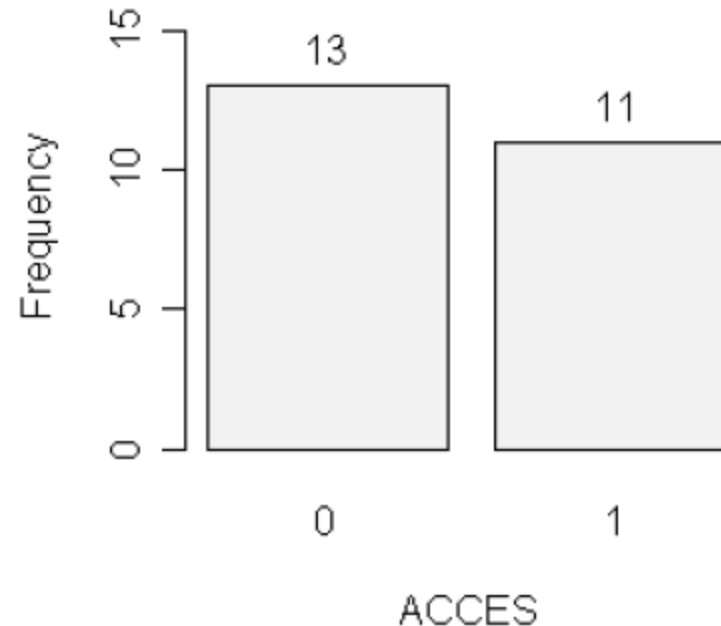   - "read data set from an attached package"

QCA – GRAPHICAL FEATURES

○ Program features include:

- Histograms
- Bar charts
- Scatterplots and scatterplot matrices

Bar Chart Example:

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/1O88 qualitativecomparatvnlyss.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
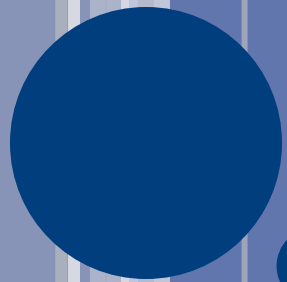 - To learn more see:

    http://dspace.learningnetworks.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

TROUBLESHOOTING

ERROR MESSAGES

o Always check the R Console screen for error messages.

o Example of Error after not properly installing QCA package:

Error in library(QCA3) : there is no package called 'QCA3'

o You can do a Google search of some errors to help find solutions

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")

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.

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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