Graphing Recruitment Chains with NetDraw
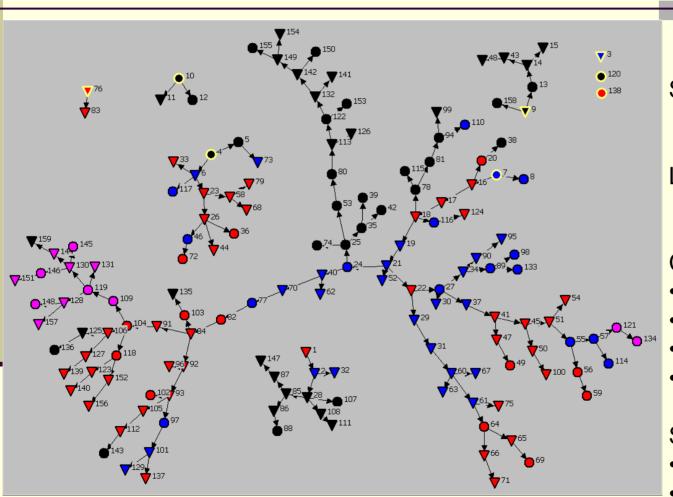
March 2007

Agenda

- NetDraw data files
- Producing a graph
- The attribute file
- NetDraw options
- Exporting the graph

NOTE: This training assumes your data is in the form of an RDSAT data file. For more information about the RDSAT data file contact your project officer.

Introduction to NetDraw

- Freely available program for graphing network data created by Steve Borgatti

- Used to graph RDS recruitment chains

- Download available at:

  - www.analytictech.com/Netdraw/setup.exe

- Documentation available at:

  - www.analytictech.com/Netdraw/NetdrawGuide.doc

Graph of Cornell Recruitment Chains

Key

Seeds =
   Highlighted

Labels =
   Respondent ID

Color:
- Purple = 1st Year
- Black = 2nd Year
- Blue = 3rd Year
- Red = 4th Year

Shape:
- Triangle = Male
- Circle = Female

Starting NetDraw

- Download the installer from:
  - www.analytictech.com/downloadnd.htm
  - Or use the above link
- Double click the installer to auto install NetDraw
- Open NetDraw from the start menu
  - Default location is:
    - Start → All Programs → Analytic Technologies → NetDraw → NetDraw

NetDraw Data Files

Two data files are used by NetDraw to produce graphs:

- The **DL File** contains information on the structure of recruitment chains (i.e. who recruited whom) and is created using RDSAT

- The **Attribute File** contains information on the attributes of each case in the data (the survey data) and is modified by hand from the RDS data file used by RDSAT
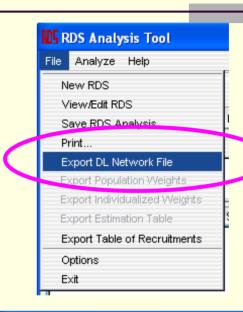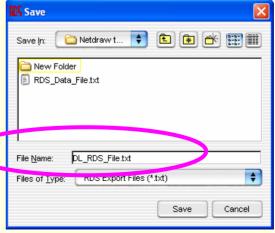
Creating a DL File with RDSAT

- Open your data file with RDSAT

- Select: File →

  Export DL Network File

- Save the DL File under a DIFFERENT name
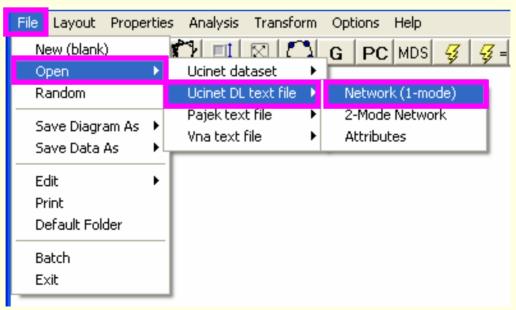
Recommendation:

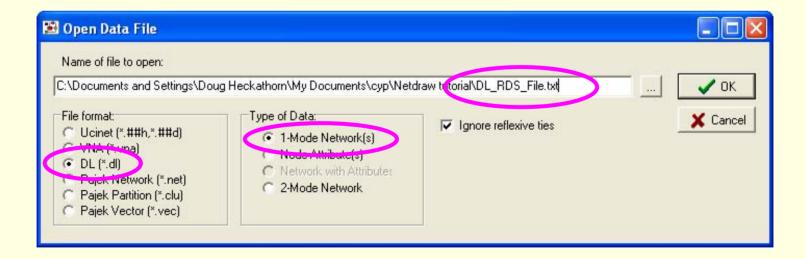 Include "DL" in the file name

- Close RDSAT

Opening the DL File in NetDraw 1

- Open Netdraw

- NetDraw will read multiple types of file, the file produced by RDSAT is in *DL text* format.

- To open this file, select:
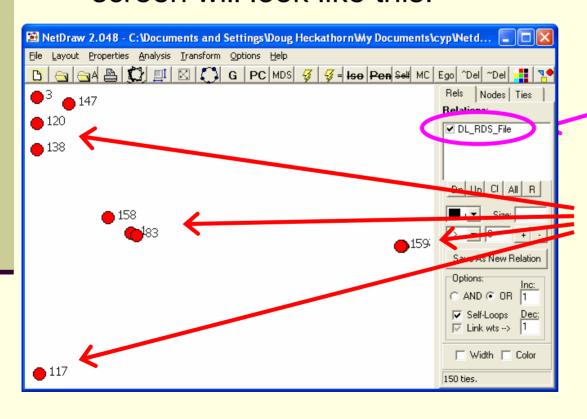
  File → Open → Ucinet DL text file → Network (1-mode)

Opening the DL File in NetDraw 2

- Select the newly created DL File using the browser.
  - Make sure the "**DL(*.dl)**" and "**1-Mode Network(s)**" bullets are selected
- Click "OK"

Opening the DL File in NetDraw 3

If data is successfully imported, the NetDraw screen will look like this:

Things to look for:

• Name of opened DL file

• Several red dots with numbers (you will **not** see all the points in your data at this time)

Questions?

Next:

- Producing a graph

Later:

- The Attribute File
- NetDraw Options
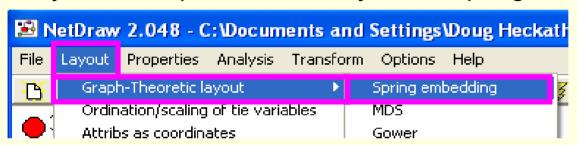- Exporting the Graph

Graphing Recruitment Chains 1

Because DL files include the who recruited whom information, we can now graph our recruitment chains. This allows us to:

- Confirm successful data importation
- Locate false seeds due to lost interview data
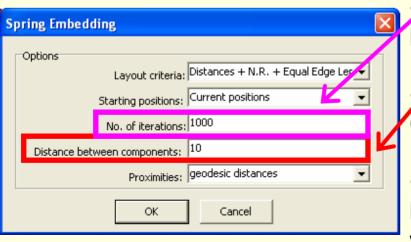- View recruitment chains.

Graphing Recruitment Chains 2

To graph the recruitment chains, select:
    Layout→ Graph-Theoretic layout → Spring embedding
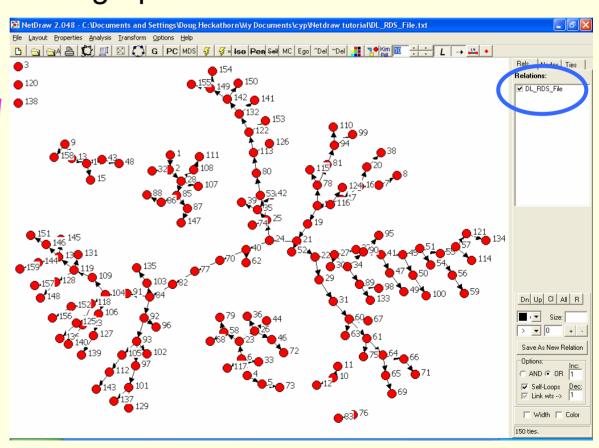

Spring Embedding pop-up menu:

• Increase the "No. of Iterations" to at least 1000.

• Increase "Distance between Components" to around 10.

• These values effect how your graph looks. You may need to play around with them to get the optimal graph for you data set.

Graphing Recruitment Chains 3

What to look for in the graph:

- Node numbers match up to respondent IDs

- Isolates are all non-recruiting seeds

- Number of Isolated chains equals number of seeds (in this case 9)

- Correct file name appears in "**Relations**" box

Questions?

Next:

- The Attribute Data File
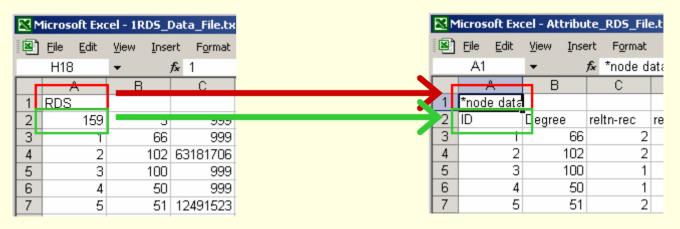
Later:

- NetDraw Options
- Exporting the Graph

The Attribute File 1

A NetDraw Attribute File is **very** similar to an RDS data file.

- Start with the RDS data file
- Open the RDS data file in excel, then:
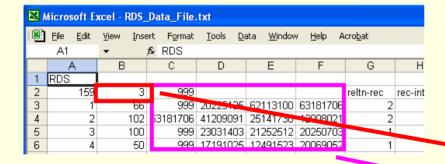 - Change "**RDS**" to "***node data**"
  - Change the *sample size* to "**ID**"

RDS Data File   **NetDraw Attribute File**

The Attribute File 2

- Continuing from the previous slide:
  - Replace the *# of coupons* cell with "degree" (labeling the personal network size variable)
  - Delete the columns of Coupon #'s (they are not needed).
- Save the file as a "Tab delimited text file", DO NOT overwrite your RDS data file.
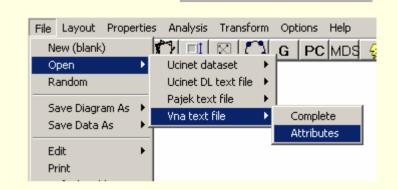
RDS Data File

NetDraw Attribute File

Importing the Attribute Data File 1

After you have imported the DL Network file

To import the Attribute File use:

- **File → Open → Vna text file → Attributes**

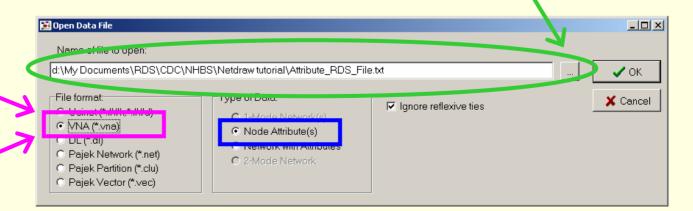Use the popup **browser** to select and open your Attribute File
Before you click "OK", set

      File format to **"Vna (*.vna)"**
      Type of Data to **"Node Attribute(s)"**

NOTE:
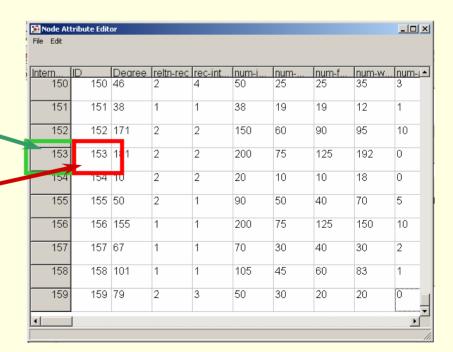NetDraw resets this selection **AFTER** a new file is chosen

Importing the Attribute Data File 2

If successful, you'll see this box:

Then you'll see your data:

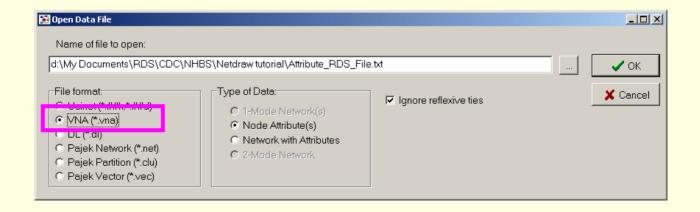The "**Intern…**" column values should match the "**ID**" column values.

Importing the Attribute Data File 3

- If you get this error:

- Re-import the attribute file and check that "VNA" is selected under "File Format". This should be the LAST THING YOU DO before clicking "OK"
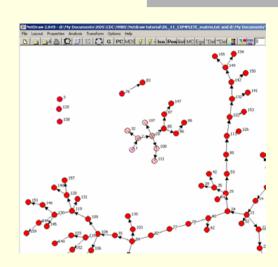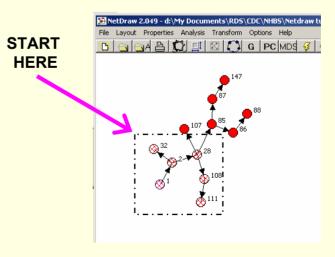
Questions?

Next:

- NetDraw Options

Later:

- Exporting the Graph

Selecting Nodes

- You may select any node by clicking on it.
- To select multiple nodes:
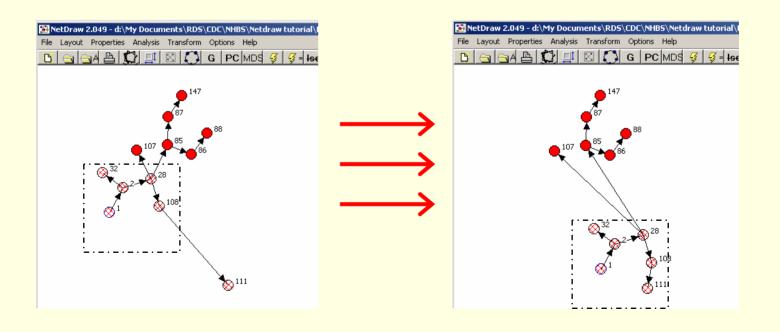 - Click on each node …or…
  - Create a highlight box

Note: Highlight box only works starting at the **upper left corner**.
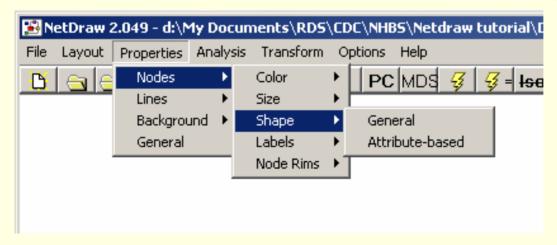

START HERE

Moving Nodes

- A selected node can be dragged to other parts of the graph.
- If multiple nodes are selected and one is moved, the rest will follow, maintaining their structure.

Properties Menu

Using the Properties menu, you can change node, line, and background size, shape, and color.
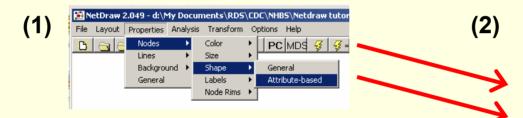
- Most options can be by "general" or "Attribute-based"
- **General** – applies same shape/color/size to all visible objects in the category
  - Example: Below all visible nodes in the graph would be given the same shape
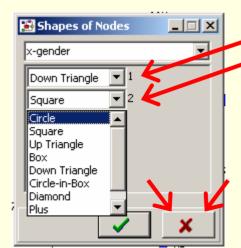- **Attribute-based** – Assigns properties by attribute (coming up)
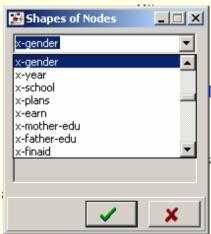
Example: Attribute-based Node Properties

1) To shape-code nodes by variable, select

Properties → Nodes → Shape →Attribute-based

(1)

(2)

2) Using the pull-down menu in the "Shapes of Nodes" popup up, Select your variable.

(3)

3) Use the pull-down menus to customize the shapes.
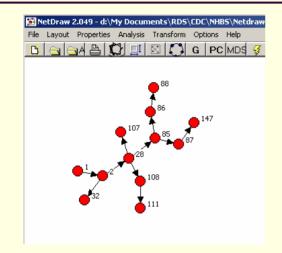
4) Click '**X**' to make changes
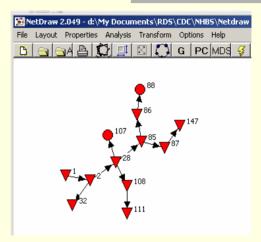
(4)

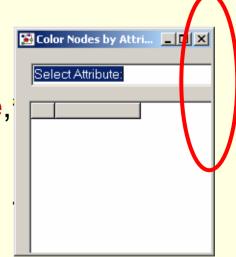# Attribute-based Node Properties 2
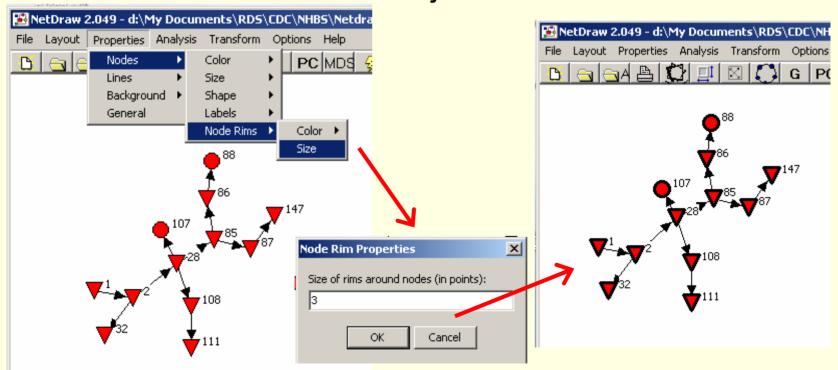
Before

After

Nodes are now shape coded for gender.

NOTE: If pull down menus are **inaccessible**, you can still navigate with the 'up' and 'down' keys or the scroll wheel on your mouse

Attribute-based Properties 3

- This same procedure can be used to set Node color, shape, and size

- Node rims can also be adjusted

NOTE: The node rims color-coded by attribute feature does not work.

Questions?

Next:

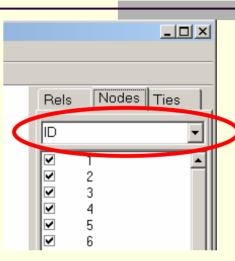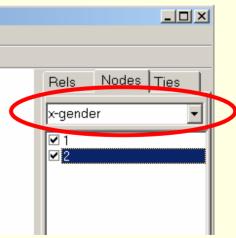- More NetDraw Options - The 'Nodes' tab

Later:

- Exporting the Graph

The "Nodes" Tab

The right side of NetDraw's window contains a series of tabs.

- "Rels" and "Ties" tabs are not useful for RDS Data
- The "**Nodes**" tab allows you to select which nodes are visible by variable value.
- By unchecking the box all nodes matching that value are no longer visible.
- This is another way to visually code the graph

The "Nodes" Tab 2

At the bottom of the window are six buttons that are useful in manipulating visible and invisible nodes.

a : **All categories** / nodes visible

i : **Switch**: checked categories are visible, Unchecked categories are hidden

s : Select the **next category**, unselect the current category

c : **Add next** category to selection

^D : **Permanently delete** all hidden nodes

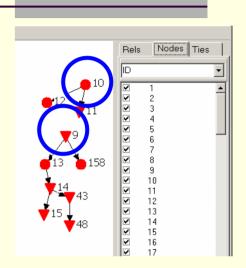**R** : **Return** to original respondent ID variable
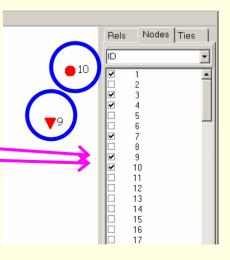
Marking Seeds With Rims

For this dataset, there are 9 seeds (RID # 1, 3, 4, 7, 9, 10, 76, 120, & 138)

- In the "Nodes" tab, Click **R** to bring up RID #s.
- Select (uncheck) the seeds (they will disappear).
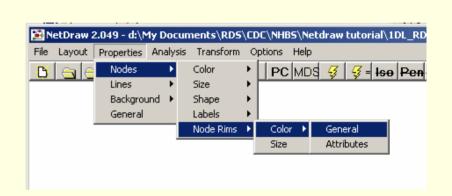- Click **i** to view only the seeds.

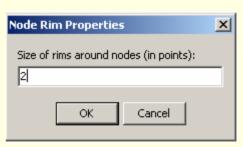- Now only the seeds are listed with checks
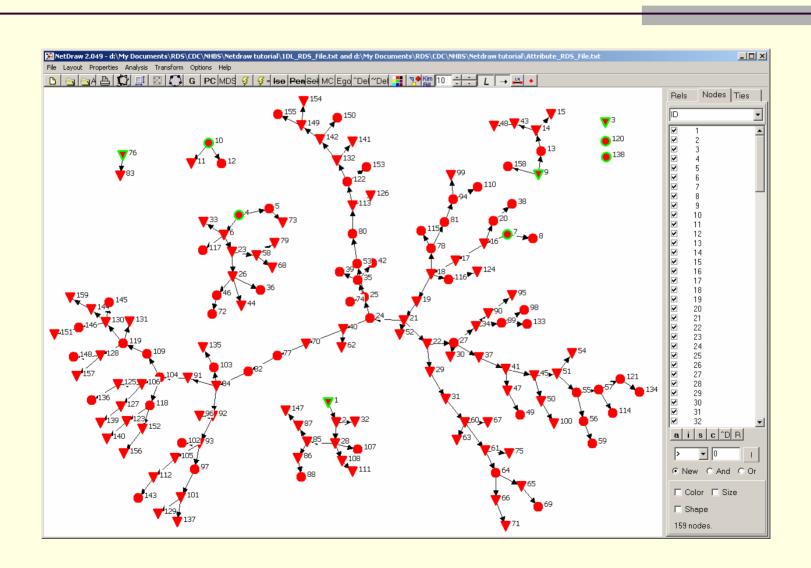
Marking Seeds With Rims

- You can now change the node rim size and color of only the seeds.
- Any changes made using the "Properties" menu only effect **visible** or **selected** nodes.
- You can use this method to adjust all aspects of nodes.
- This should be done **last**, as new changes will effect seeds as well.

Click **a** to unhide rest of data
Seeds should now be clearly marked

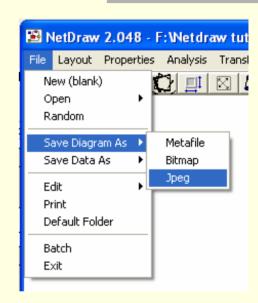# Questions?

Next:

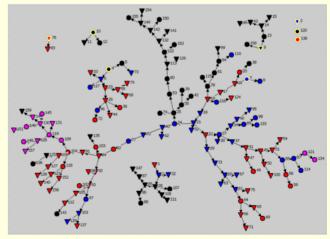- Exporting the Graph

Later:

- The end.

Exporting the Graph

To export a graph:

- Go to File→ Save Diagram As
  - Then choose your preferred picture format (all produce the same imagine)
  - Bitmaps (.bmp files) can be over **100 times** larger than the other options
- Enter a file name and save it.
- You are done.

Final Notes

1) Most of the operations shown here can be accessed using the **NetDraw tool bar** at the top of the screen

- You can hover the curser over these for a description the function

For example: **L** will toggle node labels on and off

2) NetDraw, like RDSAT & RDSCM, is maintained pro bono by a researcher, so it is neither entirely operational nor entirely bug free. **Please be patient** with it.