**Social Capital & Brokerage Lab**

For this lab we will use only one network and one attribute dataset:

**KRACK-HIGH-TEC (KHT) & HIGH-TEC-ATTRIBUTES (HTA)**

This is a dataset collected by David Krackhardt from managers of a high tech company. KRACK-HIGH-TEC is a stacked dataset containing three directed, dichotomous matrices which represent ADVICE, FRIENDSHIP, and REPORTS\_TO ties among 21 managers within the company. HIGH-TEC-ATTRIBUTES contains four attributes for each of the 21 actors, including each manager’s age (in years), tenure with company, level in corporate hierarchy, and department.

**NOTE: I use the abbreviations KHT and HTA to refer to the full filenames (KRACK-HIGH-TEC and HIGH-TEC-ATTRIBUTES) in the lab for brevity.**

1. Structural Holes using UCINET and NetDraw with **KHT** and **HTA**  
   1. If you have not already done so, unpack (Data | Unpack) the KHT dataset to get the three adjacency matrices **FRIENDSHIP, REPORTS\_TO, ADVICE. (Be sure the prefix is blank to get the filenames here.)**
   2. Run Network | Ego Networks | Structural Holes on the **FRIENDSHIP** data. From the output, who appears to have the largest Effective Size?
   3. Load the **FRIENDSHIP** in Netdraw to visualize it.
   4. When you ran structural holes in UCINET it automatically saved the output in a dataset called “FREINDSHIP-SH” (unless you changed the name). Load **FRIENDSHIP-SH** as an attribute file in Netdraw and use the effective size attribute (EffSize) to size the nodes on the graph. What information does this convey in the graph?
   5. Again using the “Nodes” tab in the control region, select the density attribute (Density) and click on the “size” checkbox to resize the nodes based on Density. What happened? Why?
2. Clustering in UCINET using **KHT** (These were covered on Wednesday.)  
   1. Run Network | Cohesion | Clustering Coefficient on the **FRIENDSHIP** data.
   2. By default, this procedure creates a file called **ClusteringCoefficients**. We are going to add those columns to the FRIENDSHIP-SH file created in the previous item. Go to Data | Join | Join Columns and enter FRIENDSHIP-SH and ClusteringCoefficients in the Datasets to join box, and then set the Output dataset to **HolesAndClusters** and click okay. Display this new file to ensure you have all the columns from both files in one dataset.
   3. Now run Tools | Similarities on this new dataset to find correlations between the variables in the columns. Which of Burt’s structural holes measures is the most like and the most opposite clustering coefficient? Why?

1. E-I Index with UCINET using **KHT & HTA**  
   1. Run Network | Cohesion | E-I Index on the **FRIENDSHIP** data, partitioning the data based on department (which is in column 4 of the **HIGH-TEC-ATTRIBUTES** dataset, you must specify COL 4 after the filename, but the L button can look it up and fill it in for you). Looking at the individual E-I index statistics, who has the most homophilous ties (more concentrated within the same department), and who has the most heterophilous (most concentrated outside the same department) ones?
   2. Rerun E-I index using the same partitioning, but instead of using the FRIENDSHIP dataset, use the stacked **KHT (KRACK-HIGH-TEC)** dataset. Bearing in mind that you ran this on a stacked dataset, what do you think these results tell you? How could you find out?
   3. Display (using the “D” icon) the **KHT** stacked dataset. Rerun the E-I index on the individual dataset that is displayed first from this command and compare the results to the results from step b. Is this what you thought was happening?
2. Brokerage with UCINET using **KHT & HTA**  
   1. Run Network | Ego Networks | G&F Brokerage roles on the **FRIENDSHIP** data, again using the department attribute. You will notice this time, when you put in the name of the attribute file, it populates the drop down list with the attributes in that file and you can just select DEPT.
   2. Open **KRACK-HIGH-TEC** in Netdraw and, using the “Rels” tab in the control region, display only the **FRIENDSHIP** relation. Compare this visualization with the results from step a. It may help to color or shape the nodes by department. Can you find at least one example of each kind of brokerage for Actor 5? (Remember, direction counts in brokerage, so make sure you have the arrows on and visible.)
   3. Because this dataset is actors by brokerage roles, it (like most output from UCINET routines) can be used as an attribute file. Load **BROKERAGE** as an attribute file in NetDraw (making sure the **FRIENDSHIP** relation is open and displayed first). Now, size the nodes by the various brokerage roles (Consultant, Representative, etc.). Does doing this help identify the different kinds of brokerage roles people play in the network?
   4. Rerun the brokerage routine using the **REPORTS\_TO** data instead of the FRIENDSHIP data, still partitioning based on the department attribute. Thinking about the nature of this relationship, what can you tell about the actors based on this output?
   5. Re-run brokerage on the **REPORTS\_TO** data, but this time use the Level attribute to partition that data. How does this data compare to the previous output? Why is it different?
3. Ego-Net Strength with UCINET and NetDraw using **KHT**
   1. Run Network | Ego Networks | Egonet composition | Continuous alter attributes specifying the **ADVICE** dataset you previously unpacked from **KHT** for the Input Network Dataset. For the Input Attribute dataset, specify **HIGH-TEC-ATTRIBUTES** and select the column labeled “Tenure.”
   2. This procedure gives information about each actors’ egonet with respect to their access to “Tenure”. If we say that getting advice from people who have worked for the company longer is more likely to lead to success, which people are most likely to succeed based on these results? What other measures reported might be indicators of success based on the composition of an actor’s advice network, and why?
   3. Go back to NetDraw, load **KHT** and ensure that the **ADVICE** relation is being displayed.
   4. Now load the dataset just created (by default it was called **ADVICE-EgoStrength**) as an Attribute file in NetDraw. Size the nodes based on the various measures (Sum, Avg, StdDev, etc.). How do the results differ?