Week 4 Summary

Course: Social and Organizational Network
Instructor: Karl Rethemeyer

February 15, 2011
Jaehee Jong,
Jeff Wasbes

Wasserman & Faust

Ch 2 Social Network Data
: Collection and Analysis
Introduction: What are Network Data?

Social network data measures at least one structural variable

<table>
<thead>
<tr>
<th>Structural Variables</th>
<th>Composition Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured on pairs of actors</td>
<td>Actor attribute variables</td>
</tr>
<tr>
<td>Cornerstone of social network data sets</td>
<td>Defined at the level of the individual</td>
</tr>
<tr>
<td>ex. transactions among corporations, friendships between people,</td>
<td>ex. gender, ethnicity for people, geographical location</td>
</tr>
</tbody>
</table>

Introduction: What are Network Data?

Mode

Distinct set of entities on which the structural variables are measured: one-mode, two-mode, etc.
Introduction: What are Network Data?

Affiliation variables
variables that are part of affiliation networks

Affiliation networks
Social networks that arise in two-mode networks
when there are two modes: one of them an event
(ex. clubs or volunteer organizations), one set of actors

Boundary Specification and Sampling

Boundary
Allowing a researcher to describe and identify the
populations of a study

Defined based on frequency of interaction and intensity
of ties among members
as contrasted with non-members
**Boundary Specification and Sampling**

Realist approach  
Boundaries as actors in the data set perceive themselves

Nominalist approach  
Boundaries through the theoretical research concerns

A set of actors consist of all social units to which there are measurements

Small populations – clearly defined actor set boundaries  
(ex. classrooms, offices, social club, and villages)

Large populations - less well-defined boundaries  
(ex. interorganizational networks in a community)
Types of Networks

Number of modes - the number of distinct kinds of social entities in the network

Networks categorized by how many modes the network has, and by whether affiliational variables are present

Types of Networks

One-Mode Networks / Actors

People, subgroups, organizations, collectives/aggregates (communities, nation-states)

Subgroups usually consist of people

Collectives/aggregates usually consist of organizations and subgroups
Types of Networks

One-Mode Networks / Relations

Representing specific connections, or “relational contents”

The kinds of relations

- Individual evaluations: friendship, liking, respect, etc
- Transactions or transfer of material resources: lending/borrowing
- Transfer of non-material resources: communications
- Interactions
- Movement: physical, social
- Formal roles
- Kinship: marriage, descent

Types of Networks

Two-Mode Networks: Two Sets of Actors

Measured in at least one way between actors in the two sets

Ex. Collection of corporate headquarters and non-profit groups in the Minneapolis/St. Paul measuring flow of donations from corporations to non-profit groups
Types of Networks

Two-Mode Networks: One Set of Actors – One Set of Events

Affiliation Networks (or Membership Networks),
arise when one set of actors is measured with respect to
attendance at, or affiliation with, a set of events or activities

The first mode in an affiliation network is a set of actors,
and the second is a set of events which affiliates the actors

Actors types can be exactly the same as those in one-mode and
two-mode networks

Actors must be affiliated with at least one event

Events are defined on the basis of membership, attendance, or
socializing in a group, etc.

Nature of events depend on the types of actors involved
Types of Networks
Ego-centered and Special Dyadic Networks

Special Dyadic – non-network relational data sampled from a larger population centering on the interaction between pairs

An actor may relate to a limited number of “special” other actors; this design can constrain interactions among actors so that all people cannot interact with all others

Ego-centered Network consists of a focal actor, ego, as sets of alters with ties to the ego and measurements on the ties

Ex. Each respondent reports on a set of alters to whom they are tied, and on the ties among these alters (Personal network data)

Network Data, Measurement, and Collection
Measurement

Social network data consist of at least one relation measured among a set of actors

Presence of relations has implications among many measurements

- The unit of observations (actor, pair of actors, or event)
- Modeling unit (the actor, dyad, triad, subset of actors, or network)
- The quantification of relations (directional vs. nondirectional)
Network Data, Measurement, and Collection

Unit of observation - the entity on which measurements are taken and an actor from whom information about ties is elicited

Modeling Unit
Levels at which network data can be modeled or summarized (Actor, Dyad, Triad, Subgroup, Set of actors or network)

Network Data, Measurement, and Collection

Relational quantification

- Directional – relational tie has an origin and destination
  Nondirectional – relation has no direction

- Dichotomous – relation is coded as either present or absent
  Valued – value relation has values such as strength, intensity, or frequency
Network Data, Measurement, and Collection

Collected through the following techniques:

- Questionnaires, Interviews,
- Observations, Archival records, Experiments,
- Other techniques
  (ego-centered, small world, and diaries/journals)

Network Data, Measurement, and Collection

Questionnaire

Most commonly used collection method

Usually contains questions used to identify relations between actors

Three types of question formats

- Roster vs. free recall,
- Free vs. fixed choice,
- Ratings vs. complete rankings
Network Data, Measurement, and Collection

Questionnaire

Whether questionnaires should be presented with a complete list, roster, or respondents be allowed to generate lists of names, free recall

<table>
<thead>
<tr>
<th>Roster</th>
<th>Free recall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Only used when researcher knows entire members of the set prior to data gathering</td>
<td>Used when entire members of the set may not be presented</td>
</tr>
</tbody>
</table>

Ex. Friends in a class

Ex. Actors are asked to name other actors, but were not presented with a roster in studies

On how many nominations respondents can provide

<table>
<thead>
<tr>
<th>Free choice</th>
<th>Fixed choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>actors are not given constraints</td>
<td>actors are given constraints</td>
</tr>
</tbody>
</table>
**Network Data, Measurement, and Collection**

**Questionnaire**

Used to reflect intensity of strength of ties

<table>
<thead>
<tr>
<th>Ratings</th>
<th>Complete rankings</th>
</tr>
</thead>
<tbody>
<tr>
<td>require respondents to assign a value or rating to each tie</td>
<td>require respondents to rank their ties to all other actors</td>
</tr>
</tbody>
</table>

**Interview**

Used to gather network data when questionnaires are not feasible

(Ex. CEO interviews in Minneapolis/St. Paul)
**Network Data, Measurement, and Collection**

**Observation**

Used to gather network data in field research, usually relations among relatively small groups of people who are engaged in face-to-face interactions.

Useful with people who are not able to respond to questionnaires or interviews.

Useful for collecting affiliation data for attendance at events.

**Archival records**

Measures ties through examining measurements from past recorded interactions.

Ex. Patterns of citations among scholars examining “who cites whom” to study diffusion of a scientific innovation.
Network Data, Measurement, and Collection

Other

Cognitive social structure is a design where respondents are asked about perceptions of network ties and perceived relations are measured (Ex. Fast food restaurant perceptions)

This design can collect more information than general sociometric designs as the respondent reports not only on their own ties, but ties belonging to other actors

Experimental

Method 1 – select a group of actors, observe their interactions in an experimentally controlled situations, then record interactions between pairs of actors

Method 2 – select a group of actors, specify which actors can interact with each other during the experiment, then record interactions between only those specified pairs of actors
Network Data, Measurement, and Collection

Ego-centered

The respondent is set up as ego with data measured among the ties from the ego to the alters (e.g., a survey about the people with whom you discussed matters important).

Small world is an attempt to determine how many actors a respondent is removed from a target individual based on acquaintanceship.

Longitudinal Data Collection

Focuses on how ties in a network change over time and how well the past can predict the future.

Commonly used to examine friendships over time.

Ex. Interaction among fraternity members over time.
Network Data, Measurement, and Collection

Measurement Validity, Reliability, Accuracy, Error

True structure
- social structure referring to a relatively prolonged and stable pattern of interpersonal relations

Observed structure
- measured network data that might contain error

“Accuracy”
- Issue of informant accuracy
  - Information collected using verbal reports and information collected through observation

People are not good at accurately reporting on their interactions in particular situations

“True” structures are of most interest and network studies should focus on long-term patterns, not particular interactions of individuals
Network Data, Measurement, and Collection

Validity
A concept of a measure is valid to the extent that it measures what it is intended to measure

Construct validity, a more formal construct, arises when measures of a concept behave as expected in theoretical predictions

Reliability
A measure of a variable or concept is reliable if repeated measurements give the same estimates of the variable

Measurement error
Occurs when there is a discrepancy between the “true” score or value of a concept and the observed (measured) value of that concept

Difference between the true and observed values

Levels of analysis must be kept in mind when determining the implications of measurement error
Introduction

Informant accuracy in reporting past events, behavior, and circumstances

Assessing the degree of validity of informant: a theory or prediction

Three substantive areas where informant accuracy has been studied:

- Recall of child care behavior
- Health seeking behavior
- Communication and social interactions
Literature Review on Informant Accuracy

Child Care

Accuracy of mothers' recall of caring for their children was tested

Recall was inaccurate as a result of underreporting

Great disagreement between respondents and professionals

( ≠ between children themselves and 'trained field observers')

Health Care

Comparison of data between interviews and objective records

Underreporting found in interviews, increased as time passed

"The best documented phenomenon of underreporting of health events as well as of a wide variety of other types of events and behaviors, is the decrease in the reporting of events as time elapses" (p 498)
Literature Review on Informant Accuracy

Communications and Social Interactions

Tested recall of social network or communication contacts

Concluded that "what people say about their communication bears no useful resemblance to their behavior",

"the error is so great that statistical and numerical techniques for washing data collected by recall instruments cannot solve the problem" (p 499)

Some Isolated Studies

Young & Young

For publicly available information, there was both agreement and accuracy

For questions where the answers were not public, there was very little agreement and high inaccuracy

Overall

On average, about half of what informants report is incorrect
Conceptual Variables: A Way Out?

When asking informants about conceptual variables (beliefs and attitudes), for validity or accuracy of such variables, a well-defined theory or a clearly described dependent variable is needed.

Conceptual variables only have meaning in the context of the theory. Its operationalization is only meaningful if the including theory is valid.

What Can Be Done?

Causes of informant inaccuracy

- Omissions as memory decays in time
- Under-estimation of time dimension: telescoping (Events in the past are likely to be recalled as being more recent than they actually are)
What Can Be Done?
<Sudman & Bradburn>

Models to compare various data collection techniques:

(ex. recollections of department store purchase
with store credit card records)

- “Aided recall” – presented with fixed alternatives
- “Record assisted recall” – keep an accurate daily diary
- “Bounded recall” – interviewed to set a baseline at least once

→ These interviewing techniques increase accuracy

What Can Be Done?
<D’Andrade and Shweder>

Memory is subject to systematic distortion due to cultural training
Reporting cultural norms rather than actual events, circumstances, behaviors, or personality traits
What Can Be Done?

Recall may be effected by:
- the subject of the study, whether informants are aided during the interview, conditions of interviews, and various cultural factors
- It is worthwhile to account for variation of accuracy both between and within instruments
- “After making empirical and/or theoretical corrections”, it is important to know not only which informants are likely to be at least accurate but also whether any informant is sufficiently accurate to rely on the informant’s responses

Devon D. Brewer (1995)
The Social Structural Basis of the Organization of Persons in Memory
Similarities in cognitive structures that individuals within different organizations have

Three communities studied:
1) a graduate academic program
2) a Taiwanese-American religious fellowship
3) a university’s public affairs department

All members of these networks were asked to list from memory every member of their network

Regardless of the type of organization, the respondents recalled members of the network as they adhered to perceived structure

Three patterns of free recall that have been identified:

Association
Adjacently recalled persons are connected by some type of relationship, thus reflecting a cognitive structure within the recaller’s mind

Serial order
Order in which people are recalled reflects their salience in the mind, the first person thought of likely has more meaning than the last

Frequency
How often a person is recalled indicates that person’s salience within the recaller’s mind
Study 1: Graduate Academic Program

15 graduate students were asked to list all the graduate students

People within the same cohort (subject year) were recalled adjacently much more often and with much less time between responses than with people who were from different cohorts.

How closely students were listed when the respondents freely recalled them in a list

The number indicates the recalled persons’ year in the program

The closer two persons are, the more they were recalled consecutively.

Figure 1. Graduate academic program: two dimensional correspondence analysis representation of adjacencies on recall orders (p. 383)
Study 1: Graduate Academic Program

Respondent would recall students in closer cohorts than more distant ones.

While this study showed that the cohort structure was critical for how the network was organized in memory, it could not show which aspect of the cohort structure was most important; the basic organization of a university setting, or the tendency for social interaction to stay within a cohort.

Study 2: Taiwanese-American Religious Fellowship

25 people within a religious fellowship were asked to recall all persons within the entire fellowship.

People recalled adjacently were more likely to be socially close than chance would predict; the adjacency of recalled names could not be explained by other social structures, such as kinship or gender.

Two respondents attempted to list everyone in alphabetical order, yet their response pattern clearly showed a bias for social proximity.

Persons socially closer to the respondent were recalled earlier, as were people who are highly visible within the organization.
The Social Structural Basis of the Organization of Persons in Memory

One subject’s recall demonstrating the effect of social proximity on associative patterning

Adjacently recalled pairs of persons are joined quite high

Subsequences of recalled persons correspond to the overall social proximity group structure

Persons listed together were perceived to interact with one another a lot

Figure 2. Religious fellowship: maximum link hierarchical clustering of the social proximities among the persons recalled by one subject (p. 384)

When two adjacently recalled people were highly socially connected, the respondent took very little time between recalling them

As social proximity decreases, inter response time (IRT) rises

Figure 3. Religious fellowship: for one subject, the relationship between social proximity and raw IRT for the adjacently recalled pairs of persons for one subject (p. 385)
Study 3: Department in a Formal Organization

13 employees of a public affairs department were asked to recall the names of their coworkers.

Those people who worked closely together were often recalled adjacently.

Factors such as status within the organization, spatial locations within the office, and work sections within the department could not account for the clustering of recalled people.

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How recalled persons are clustered and the structure between work proximity and adjacency in recall.

Circles represent persons in terms of work proximity between People; triangles are those same people in terms of adjacency in recall.

Lines connect each person’s position for work proximity to one for adjacency; short lines illustrate similarity between work proximity and adjacency in recall.

Figure 4. Department of a formal organization: two dimensional principal components analysis representation of persons in terms of work proximity (circles) and adjacency in recall (triangles) from aggregated data (p. 387)
Study 3: Department in a Formal Organization

Response time between adjacently recalled people relied on their social proximity.

Order that people were recalled was based on proximity to the respondent as well as visibility (persons of higher status).

Adjacently recalled pairs of persons are joined quite high.

Subsequences of recalled persons correspond to the overall work proximity group structure.

Conclusions

In terms of associative pattern, the fundamental cognitive structure of persons is from on the community’s social structure, rather than any other type of structure.

In terms of frequency and serial order pattern, variables that dictate the ‘salience’ of person (how early on they are recalled) include their social proximity to the respondent, their status or their visibility within the social network.

Pattern of recall was the same among all respondents from all three different types of organizations, and across time (the third study was repeated after 3 weeks with the same result).
Main Points to Consider

- The structure of organization (mental models) can help to explain patterns of error in descriptions of social interactions.
- The “best” informants (regular attendees at a series of events, for instance) are best used to reveal long-range stable patterns of events.
- The “worst” informants (irregular attendees at the same series of events, for instance) are best used to reveal details of a particular event.
Bernard, Kilworth, Sailer

- About half of respondents’ recall about interactions is wrong:
  - People forget about interactions, or
  - People provide false recalls: interactions that never occurred
- The study that produced these findings was extended by the authors

Primary Focus

- The BKS study needed a more rigorous measure of social interactions over the long term
- How can respondents’ bias toward long term patterns of behavior be explained?
The Study

- Attendance data collected from a series of colloquia (9 sessions)
  - Provides a robust long term measure of events
- Attendees were asked to provide information about who attended the 9th and final session
  - Responses were collected via computer allowing for collection of
    * Order of response
    * Time to respond

Principles from Cognitive Psychology

- Human memory is organized.
- The organization embodied in a mental structure is revealed in free recall.
- The organization of memory is based on experience.
- The tendency of a person to recall an element that occurred in an event depends on two factors: (a) the amount of elaboration of the person’s mental structure, and (b) the degree to which the element is typical in the kind of events being examined.
- The tendency of a person to falsely recall an element that did not actually occur in an event depends on two factors: (a) the amount of elaboration of the person’s mental structure, and (b) the degree to which the element is typical in the kind of events being examined.
Implications for Accuracy

“In-group” members should have more elaborate mental structures and therefore should:
- forget others less often;
- Be forgotten less by others;
- Generate more false recalls.

Implications for Accuracy

“Out-group” members should have less elaborate mental structures, and therefore should:
- Generate more “forgets” in the data;
- Be forgotten more often by others.
Results

- Consistent with hypotheses based in cognitive psychology
- More experienced members err toward long term patterns in attendance
- The caveat:
  - There is a maximum point for accuracy (0.85)

Results

- Less experienced members provide more accurate data about one instance
- The caveat:
  - There is a maximum point for accuracy (0.95)
Laumann, Marsden, Prensky

THE BOUNDARY SPECIFICATION PROBLEM IN NETWORK ANALYSIS


Main Points to Consider

- Boundaries may be defined through rules of inclusion: for the selection of actors to be included and to the choice of types of relations among those actors to be studied.
- The stakes are high: errors in defining system boundaries can result in gross misrepresentations of the network/system under study.
- There are no hard and fast rules – only that boundary specification needs careful thought and attention in network analyses.
- The article does not focus on egocentric approaches to network generation, rather on sociocentric or structural approaches
2 Approaches to Boundary Definition

- **Realist**: The network exists as an artifact of some subjective meaningfulness (conscious experience) of the actors within it. Boundaries are defined by rules or definition.

- **Nominalist**: inclusion in the network is determined and imposed by the analyst. The actors may not realize the reality of the analyst's assumptions, and awareness of these boundaries becomes an empirical question.

Definitional Foci for Inclusion of Actors

- **Actors**
  - Positional approach
  - Reputational approach
- **Relations**
- **Events**
Laumann, Marsden, Prensky (1989).  
The Boundary Specification Problem in Social Network Analysis

<table>
<thead>
<tr>
<th></th>
<th>Attributes of Nodes</th>
<th>Relations</th>
<th>Participation in Event</th>
<th>Multiple Foci</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Realist</strong></td>
<td>Study of small, tightly bounded groups</td>
<td>Utilized in very few studies. “Primary group” concept used to study and understand network behavior, not as method for network definition.</td>
<td>Primary alternative to Realist/Attributes approach. Participation in series of events reveals cliques; influential actors; nodal elements.</td>
<td>Social class; ethnic community: both use nodal attributes in combination with relational evidence.</td>
</tr>
<tr>
<td><strong>Nominalist</strong></td>
<td>Applied to expansive groups (100's or 1000's). Actors are often organizations.</td>
<td>Studies of the “small world” problem. Relations are traced from starters to targets.</td>
<td>Used infrequently. Invisible college study cites interest of scientists in a research area irrespective of disciplinary focus.</td>
<td>Usually involves defining some attributional inclusion rule in conjunction with a relational rule.</td>
</tr>
</tbody>
</table>

Combining Strategies

• Can cross over realist/nominalist approaches
• Uses up empirical ‘degrees of freedom’
On Inclusion Rules for Relations

- Lack of typology for social relations
  - Relations need careful thought and clear definition
- Partial Systems Fallacy
  - Financial transactions between agencies
  - Inclusion in network restricted by geography
  - Any problems here?

Conclusions

- There are no hard and fast rules
- Theoretical underpinnings for relations; activities need careful thought
Kilduff and Krackhardt

BRINING THE INDIVIDUAL BACK IN: A STRUCTURAL ANALYSIS OF THE INTERNAL MARKET FOR REPUTATION IN ORGANIZATIONS

Main Points to Consider

- People in an organization attempt to perceive social networks.
- Perceptions, often with judgment attached, influence decisions and behavior of others.
- These links between individualist and structural approaches are important in network analysis.
- “…the individual must be brought back in to acknowledge and account for the micro-foundations of structural research.” In fact, much of structural theory relies on social psychological underpinnings.
- Much of the literature published prior to this article about structural analysis had rejected the premise that individual psychology played an important role in structural phenomena.

Balance Theory

- The mind strains toward cognitive balance
  - The friend of one who is positively valued is also positively perceived
- Knowing this, people tend to make their connections to positively valued others known
  - Basking in reflected glory
- Little is known about this effect in the context of performance within organizations

A Market for Reputation

- A market represents competition among people for some resource
- The more positive one’s reputation, the more valuable that person is in the market
- Pricing occurs as a cognitive process involving status (title) and social ties
Hypothesis 1

- The prominence of an individual’s most prominent friend will influence the individual’s performance reputation in an organization, controlling for the individual’s formal status and job performance.

- An important note: in this market, the perception of value are more important than the actual, objective value.
  - People construct ‘mental maps’ and use them to navigate their social worlds.

Hypothesis 2

- Measures of perceived network relations will lead to better predictions of performance reputation than will measures of actual network relations.
**Methods**

- Small Silicon Valley tech Company
- 3 equal owners, also employees (managers)
- Survey administered to every employee (n=36)

**Measures**

- Respondents mapped their own friendships
- Respondents mapped the friendships of every other employee
  - Friendships were included in the objective map if reciprocated
- Respondents were asked to construct an ‘advice map’
  - Advice relationships were included regardless of reciprocity
Perceptions contain discrepancies


TABLE 1
Summary of Research Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Definition of Each Cell in Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependent</td>
<td>Respondent i’s perception of the job performance of person j, rated on a seven-point scale, for all j’s not supervised by i</td>
</tr>
<tr>
<td>Performance reputation matrix</td>
<td></td>
</tr>
<tr>
<td>Independent</td>
<td>Advice indegree centrality of person j’s most central friend, based on friendship and advice networks perceived by i</td>
</tr>
<tr>
<td>Perceived friend’s indegree centrality matrix</td>
<td></td>
</tr>
<tr>
<td>Actual friend’s indegree centrality matrix</td>
<td></td>
</tr>
<tr>
<td>Perceived friend’s formal status matrix</td>
<td>Level in organizational hierarchy occupied by person j’s highest-level friend, based on friendship network perceived by i</td>
</tr>
<tr>
<td>Actual friend’s formal status matrix</td>
<td>Level in organizational hierarchy occupied by j’s highest-level friend, based on aggregate (LAS) friendship network</td>
</tr>
<tr>
<td>Control</td>
<td>Supervisor’s evaluation of the job performance of person j on a seven-point scale</td>
</tr>
<tr>
<td>Job performance matrix</td>
<td></td>
</tr>
<tr>
<td>Formal status matrix</td>
<td>Level in the organizational hierarchy occupied by person j</td>
</tr>
</tbody>
</table>

RPAD 637 (Spring 2011 / Week4)
Analysis

- OLS produces biased results
- Multiple Regression Quadratic Assignment Procedure (MRQAP)
  - OLS performed lots of times (1000 in this study) on permutations of the original matrix
  - Coefficients and R²'s generate a distribution against which original estimates are compared
  - If fewer than 5% of the betas from the permuted matrices are larger than the observed data, the beta is considered significant at the .05 level.

RPAD 637 (Spring 2011 / Week4)

<table>
<thead>
<tr>
<th>TABLE 2</th>
<th>Means, Standard Deviations, and Correlations*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>Means</td>
</tr>
<tr>
<td>1. Performance reputation</td>
<td>4.90</td>
</tr>
<tr>
<td>2. Friend’s poise and centrality</td>
<td></td>
</tr>
<tr>
<td>a. Perceived friend’s influence</td>
<td>5.70</td>
</tr>
<tr>
<td>b. Actual friend’s influence centrality</td>
<td></td>
</tr>
<tr>
<td>c. Friend’s status</td>
<td>1.66</td>
</tr>
<tr>
<td>d. Actual friend’s status</td>
<td>1.63</td>
</tr>
<tr>
<td>3. Job performance</td>
<td>4.91</td>
</tr>
<tr>
<td>4. Formal status</td>
<td>1.23</td>
</tr>
</tbody>
</table>

* All correlations are significant at p < .01, except for those with an asterisk.

The dependent variable, performance reputation, was highly correlated with all four measures of the independent variable.
Bringing the Individual Back In: A Structural Analysis of the Internal Market for Reputation in Organizations

Actually having friends in high places does little to boost your work performance reputation at work. You need to make sure that others perceive those friendships if you want their performance reputation – whether those friendships actually exist or not.

TABLE 3
Results of Multiple Regression Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Status Models</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Source’s generosity</td>
<td>1.00**</td>
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<td></td>
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<tr>
<td>Perceived friend’s</td>
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<tr>
<td>Ingruence centrality</td>
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<tr>
<td>Actual friend’s</td>
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<td>Ingruence centrality</td>
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<td>Perceived friend’s</td>
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<tr>
<td>Status</td>
<td>0.319**</td>
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<tr>
<td>Actual friend’s status</td>
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<tr>
<td>R-squared</td>
<td>0.199**</td>
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<tr>
<td>Ash performance</td>
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<td>Formal status</td>
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<tr>
<td>Intercept</td>
<td>2.934**</td>
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</tbody>
</table>

*p < .05, two-tailed test
**p < .01, one-tailed test

RPAD 637 (Spring 2011 / Week4)