

Towards a Networks Theory of Political Parties:

A Social Networks Analysis of Internal Party Cleavages in Presidential Nominations,
1972-2008 *

Hans Noel
Assistant Professor
Georgetown University
hcn4@georgetown.edu

September 30, 2012

Abstract

A number of political scientists, especially those studying political parties, have increasingly turned to social networks as a way to understand the informal connections among political actors. I discuss some of the potential limitations of this research, leading to recommendations for developing theories of political networks that may diverge from the sociology literature. I apply some of these approaches to a dataset of more than 8000 presidential nomination endorsements from 1972 to 2008 to identify the network of support in the nominating party, as well as the key players in that dynamic. Analysis gives insight into who is important and what groups are stable.

*Paper prepared for the “American Political Parties: Past, Present, and Future” conference, Oct. 8-9, 2012, Charlottesville, Va. I would like to thank Bruce Desmarais, Matt Grossman, Gregory Koger, Lorien Jasney, Seth Masket, Suzanne Robbins, Brian Schaffner, Jennifer Victor, John Zaller and participants at seminars at the University of Massachusetts, the University of Michigan, the University of Wisconsin, the Political Networks Conference at Harvard University and the Political Methodology conference at Yale University for useful comments on earlier drafts of this project.

1 Introduction

A growing literature has begun to conceptualize political parties as networks of actors. This approach allows for a central role for informal actors, and weighs formal office holders in the party and in government just so far as they participate in the network. Under this approach, a party is the organized team that competes for office.

This approach has been both theoretic and empirical. Some work adapts the network as a theoretical lever (e.g., Schwartz 1990; Bernstein 1999; Monroe 2001; Dominguez 2005; Cohen et al. 2008; Masket 2009). But much of this work has used networks as a metaphor without tapping the power of networks analytic methods. For example, Marty Cohen, David Karol, Hans Noel and John Zaller (hereafter CKNZ) argue that “the party” chooses its nominee through informal coordination — facilitated by a network of contacts. But the measure of the elite party used in that work ignores any features of the network structure. So network scholars might cite CKNZ favorably, but the work does not model the network as a network.

Other work has applied formal social networks analysis to political parties (e.g., Skinner 2005; Doherty 2006; Heaney and Rojas 2007; Koger, Masket and Noel 2009, 2010). But often this work is forced to consider relationships that are theoretically one step away from the main micro-processes that generate the network. For example, Koger et al. use the trade in donor names to make links among various informal party organizations and interest groups, but theoretically we are interested in kinds of cooperation that are much more central to the missions of these organizations than their fundraising strategies.

There is nothing inherently wrong with these approaches. Analysis gets leverage where it can, and not all work can address all questions. But there are significant disconnects between how theoretical approaches think about “parties as networks” and how empirical social network researchers estimate them. This project aims to bridge some of those gaps.

For the sake of orientation, I focus on CKNZ, which has become a widely used by scholars interested in the “informal” party.

2 Theory: Parties as Networks

A significant direction of recent scholarship on political parties has emphasized the informal nature of party organization. This opens up our understanding to parties to a number of other considerations, including the role of policy-demanding outsiders (e.g., Bawn et al. 2012; Bawn and Noel 2007; Masket 2009).

While recent scholarship expands the scope of who is in the party, it does not change the primary task that

parties need to accomplish. Parties are still coalitions (e.g., Schattschneider 1942; Aldrich 1995). However, since diverse actors, inside and outside government, are participating in the management of coalitions, we have to look to new places to see that management occurring.

Claiming that informal actors are important in managing coalitions does not have to imply that anything about the network structure is important. But such a claim is a natural extension. If informal actors can coordinate in a party, how do they do so without a formal institution? What sort of candidate should they be seeking to coordinate on, and how would we know if they did? According to CKNZ, the party network exerts its power by throwing support behind its favorite candidate.

That coordination *could* be said to happen in an atomized environment, in which individuals coordinate independently. In such a case, the problem could be described as a large-scale coordination game. Some actors want to support one candidate, or work toward one policy goal, or emphasize one set of talking points, while others prefer other candidates or goals. They will be more successful if they focus their efforts on the same goal, but without having agreed, they might exert their efforts in contradictory ways. In particular, issues that divide the coalition should be avoided in favor of issues that unite it.

Coordination games can yield successful equilibria for their players, especially when there are focal points. It is possible, even likely, that ideology serves as such a focal point Noel (2006); Masket (2009). If ideology explains the common action, then the network is not that important. Everyone can receive the broadcast of the ideological message from opinion leaders, regardless of their personal connections. But ideology is perhaps not enough to bring every actor into line.

And so scholars posit that networks help with the informal diffusion of strategies (Ringe and Victo, 2012; Koger, Masket and Noel, 2009). Networks can also reveal factions within the party (Koger, Masket and Noel, 2010). If the party is not following a hierarchical structure, then the structure of the connections within the network can reveal how the party actually is organized. Who is connected to whom and how?

2.1 Network Terminology

The value added from thinking this way is that these informal connections in a network can be explicitly modeled. It is more than a metaphor. If we can identify the key actors, as well as which are connected to which, we can describe a graph or network, which can in turn be described with summary statistics.

Any relational data can be represented as a network. Thus network models can be very flexible, although that flexibility may be a double-edged sword, as we shall see below. A network is anything that can be treated as a number of “vertices” connected by “edges.”

Vertices The main element of a network is the vertex, also sometimes called a “node,” “actor” or “point.”

In the case of a political party, the vertices may be the people who make up the political party: candidates, consultants, interest advocates, elected officials and so on.

But vertices can be anything between which there might be “edges.” So our vertices might be committees who share members, or even things like documents that share words. Obviously, some of these kinds of structures are meaningfully interpreted as a “network,” while others might not be.

Edges The network is formed connecting vertex to vertex, by an edge, also sometimes called a “link,” “tie” or “line.” Among actors, an edge might be a point of communication or shared knowledge. It might be the passing of information or resources, such as campaign contributions.

Bipartite networks Of particular importance for understanding networks in political science is the concept of a bipartite network. Our structure might be induced because we have two kinds of “vertices” and ties only exist from one kind to another. The classic example (Davis et al. 1942) of this is the network of social clubs to which a group of people might belong. The people are one kind of vertex. The clubs are another. A club cannot be a member of another club, and a person cannot be a member of another person, but a person can be a member of a club. Many networks in political science have this structure.

The network model of the political party draws a large set of actors in as nodes. They need not only be party officials. Campaign consultants, pollsters, candidate surrogates, even grass-roots organizers can be part of the party network. And ties can be similarly diverse. Actors presumably communicate directly with one another, but of particular interest is when actors move from one campaign to another, work actively on the same legislation, or direct one another to help others in the network.

3 Barriers to Investigating the Network Model

Some of the interactions that make up the Network model can be observed. But often, the data we observe does not correspond to the patterns we theoretically are interested in. What is more, we often do not actually know what patterns we should be looking for, because we are building on work that was modeling very different phenomena. In short, political scientists trying to understand the role of parties through social networks have been using the wrong general approach to look for the wrong kinds of patterns in less than ideal data.

3.1 Social vs. Political Networks

Social networks analysis has flourished in a variety of disciplines, but the social science discipline in which it has had the largest impact is sociology. Sociologists using network methods are interested in the spread of behavior, the context of social interactions and the like. Social networks have thus been fruitfully applied to such cases as the development of a schism within a karate club (CITE), the friendship patterns among high school students (CITE), success in the job market (CITE), and so forth.

Sociology and political science are cognate disciplines, and many of the theories that explain behavior among these social phenomena might also explain political phenomena. But at least some of the forces that govern the development and maintenance of a political party are probably not the same as those that govern the high school cafeteria.¹

For this reason, it is important that political scientists interested in importing network methods develop their own theories about the micro-processes that generate networks, rather than adopting those developed for other kinds of social phenomena.

The primary difference is that political networks are purposive, rather than natural. This rules out a number of processes we think might drive network formation:

Preferential attachment There is a tendency among networks for nodes that have many ties to attract still more ties. Everyone wants to be friends with the popular kid, and everyone wants to have coffee with the boss. This process is one possible reason we observe many “scale-free” networks, in which the “degree distribution” of the network follows a power law. The degree of a vertex in a network is simply how many edges connect to it. Scale-free networks have a small number of vertices with many connections, and a great number of vertices with only one connection. Scale-free networks might be explicitly designed, as in the hub model of airline connections. But they might also develop if actors tend to form ties to others who already have a lot of ties.

Homophily Another common determinant of ties in social networks is the tendency of actors to connect to those who are like them. Homophily is so common that it is a known threat to estimates of casual influence (see below).

Triadic Closure Two nodes who are each connected to a third node tend to be connected to each other as well. In a friendship network, for example, if Claire is connected to John and Brian, she might have

¹The reader may now take a moment to chuckle at their own joke about Congress.

an occasion to introduce them to each other, or the circumstances that led each of the boys to know Claire might lead them to also know each other.

These tendencies probably also exist in political networks, which are of course also made up of people who have social natures. But there are other, politically oriented incentives that might also be at play, and that might even overwhelm these social tendencies.

From the point of view of a political party, the need to manage a coalition ought to loom large. And building and maintaining a coalition involves a number of incentives at odds with the above.

For example:

A winning coalition The main thing a party must do is win, either an election or votes in a legislature.

This requires, in most settings, building a coalition that is 50 percent of the voting base, plus one. Some circumstances might require slightly larger coalitions. But if attaching only to those who are similar to you (homophily) or that you have been introduced to (triadic closure) does not get you to 50 percent, you have to keep building the coalition.

A minimal winning coalition An oversized coalition can be as much trouble as an undersized one, if it requires dividing the spoils too extensively, or if it introduces too many divergent views. The network nature of coalitions might be one reason why we sometimes see oversized coalitions; cutting out a few excess members might lead to those attached to them also leaving. Regardless, a party leader may have an incentive to avoid commitments to groups whose votes are not needed.

A united front Holding together a party requires that groups with potentially different goals set aside those differences for the sake of the party. To maintain this, actors within the party will have to work with those they disagree with to cement the coalition. Successful presidential candidates have to appeal to all groups. Successful legislation has to accommodate all their needs.

It is not entirely clear what these incentives look like in network data, especially when both parties are struggling with these different incentives, and one is at least temporarily more successful than another. Political scientists need to work out these implications.

3.2 Bipartite Data

As noted above, the data that political scientists use to study networks are often bipartite in nature. Legislators can cosponsor bills. Delegates can appear on the same committees. Candidates can share donors.

Since we rarely observe informal interaction among political actors, especially not systematically, we often must rely on these kinds of data.

Such data can be re-expressed as a one-mode network. One simply treats sharing a connection to the other kind of vertex as a tie itself: Two actors who appear on the same committee have a tie themselves, even if there is no evidence that they ever spoke to one another at a committee meeting. This “projection” into one-mode space is the approach recommended (CITE) for this kind of data, although more recently new techniques have been developed.

It is worth noting that this structure is still a network, but it can be deeply different from the kind of network that involves direct connections among actors. Two legislators who vote the same way on the same bill can be said to have a “tie,” but it is not a tie that has the same interpretation as two legislators who actively have worked together on that bill.

The theory of parties as a network implies something about the information connection from one actor to another. It does not necessarily imply something about which committees they should serve on together.

3.3 Causal Inference

The mechanisms by which a party network might coordinate have many features in common with the dissemination of other traits through a network. For instance, some scholars think that political attitudes among voters spread through a network. (Sinclair 2012). This, in turn, reflects the very large literature attempting to estimate the “contagion” of everything from obesity to smoking to depression to divorce in a network (Christakis and Fowler). This research notes that for all of these traits, those with connections tend to be more alike than those who are not, and that pattern might be due to the “spread” of the trait through the network.

But all of this research faces serious difficulties in establishing causal inference. There are three reasons why actors who are connected might be similar:

1. One actor might have influenced the other actor to change on that trait, perhaps even subconsciously. We would call this contagion or **influence**. In the case of obesity, one actor sees the example set by another in exercising, or in overeating, and decides it is acceptable for themselves.
2. The two actors might have established their ties in the first place because they were similar. This is **homophily**. In the obesity case, two actors who have similar interests in physical activity, or similar tastes in food, might be more likely to meet and become friends.

3. The two actors might have similar experiences. We call these **environmental** factors. In the obesity case, the opening or closing of a gym or a fast food restaurant near where two friends live might affect them both similarly.

These concerns all also might relate to attempts to understand parties. Actual party coordination is akin to actual influence. It posits that the reason actors connect with one another is that they are trying to form a united front behind a coalition they hope will win.

But homophily might explain those same patterns. Since similar actors will join the same party - and might even be closely related within that party - we would expect some homophily within a party. In the same way that it is hard to disentangle the effect of preferences from the effect of parties in legislative voting, so is it hard to disentangle them in network data.

And common environmental factors might also explain ties. Two politicians from the same state or with similar district demographics might end up connected to the same campaign consultants.

3.4 Strategies for moving forward

These observations suggest two important strategies for analyzing data in search of party structure. The first is to get better data.

Some scholars have done so. Desmarais, Moscardelli, Schaffner and Kowal 2012, for example, examine appearances at joint press events by members of the U.S. Senate. This is also technically bipartite data, with senators and events as two kinds of nodes. But the projection is a meaningful network. A joint appearance at a press event represents real collaboration. Desmarais et al. do not examine their data for partisan patterns but they might.

Even with better data, we should also ask questions about the network patterns that are derived from the theories we have of political behavior, not social behavior. And in some cases, we might be able to ask those questions of imperfect data as well.

That is the strategy employed by the second part of this paper. Since many network applications will of necessity require us to look indirectly at what we are interested in, we should try to develop hypotheses that are about the things we can observe, rather than about the things we cannot.

4 Hypotheses to fit the bipartite data

4.1 The Data

Most of the efforts at measuring a social network described in the previous section identify a network of party actors, but the match between these actors and the “party elite” actors described by theory is not always ideal. Koger et al., for instance, describe a network of interest groups, publications and campaign committees, but many key interest groups and party leaders never solicit anyone for donations. Using campaign contributions can be equally problematic, if some influential figures wield their power without their pocketbook.

This dataset is much closer to the set of actors we think of when we think of the informal party, and it focuses on behavior closely related to the theory. It links every actor and group who participates in one central party activity, taking an early position in presidential nomination politics. The scope is thus wide, since anyone, even those who are not officially recognized by the party, can enter. And the action taken is an act of coordination. So these actors are a natural place to look for patterns in the party network. However, the data are still not a direct observation of every kind of party coordination. They are still limited to their specific context, but that context is the one provided by the theory in CKNZ.

The data consist of every possible public endorsement for the major party presidential nominations found in newspapers and magazines in the year prior to the primaries, up until the day before the Iowa caucuses. Most of the data were originally collected for analysis in CKNZ (2008), which examined the relationship between endorsements and success in the primaries. Data from 2008 were collected separately by the author, following the same procedures.

The data stop at Iowa to ensure that the decision to endorse is not endogenous to any electoral victory. The decision of course could be endogenous to polls, money raised or media coverage of the candidates. However, CKNZ (2008, see especially chapters 8 and 9) show that endorsements before Iowa seem to be largely independent of those other factors. It is still likely that endorsers are affected by considerations of “electability,” but it is their own estimates of electability, not that revealed by electoral contests.

The decision to stop before Iowa both aids and hinders interpretation. On the one hand, we can be less concerned that the network of endorsers is not simply driven by the desire to get on the winners’ bandwagon. This is important, because successful candidates eventually draw even detractors, at least before the general election. If we want to uncover any internal structure, we need to observe it before too many elites are switching to general election mode. On the other hand, if it is the case that key actors hold back until

the candidates have proved themselves in a few state contests, we will miss their participation. In 2008, Barack Obama secured the support of a number of high profile party insiders, including John Kerry and Ted Kennedy, but only after he received the plurality of votes in the Iowa Caucuses. Kerry and Kennedy were not bandwagoning a candidate who was already assured of a win, although they were apparently reacting to an increase in Obama's apparent probability of victory. The current analysis errs on the side of avoiding endogeneity, but at the cost of not capturing insider support like Obama's.

The data thus consist of every pre-Iowa link between an endorser and an endorsee from 1972 to 2008. Because most elites endorse only one candidate per cycle, the main links between endorsers come from their participation in multiple cycles. Thus the network would trace out long-standing factions or clusters, rather than personalistic or election-specific ones.

What would network theory predict about these data? We know that a party as a network would predict many things about behind-the-scenes interactions related to the nomination, but we do not observe that. We observe the final decision to endorse.

4.2 Factions

First, there is the question of how factional the party might be. If, following Sundquist (1983), we think that a party, and especially its nomination for office, is a prize or "a terrain to be fought over, conquered, and controlled first by one element, then by another," then we might expect to identify the combatants in the network. If parties are primarily terrain for battle, and if that conflict represents long-standing cleavages within the party, we should find factions that reflect those conflicts in who endorses whom from contest to contest.

For example, the 2008 conflict among Republicans is said to reflect a fracturing of the social conservative and economic conservative wings, (and to some, even the foreign-policy hawk wing). Giuliani and Romney were suspect with social conservatives for various reasons, while Huckabee was suspect with economic conservatives. McCain was suspect to many in the Republican Party on a variety of fronts. Among Democrats, the conflict in 2008 was more about style, but potential cleavages over the Iraq War and social vs. economic liberalism emerged in earlier years.

On the other hand, a network theory of party suggests that the party nomination is more than just a prize that is up for grabs to the most successful interest group. The informal network of policy demanders would want to find a candidate who can appeal across *all* of its various potential factions. In that case, we might expect to find a dense network without much factionalism at all. There may be conflict, but the party

actors know that they have something in common that they are trying to advance, even if that something is merely shared control of office. Party leaders in a party network have to trade off their policy preferences with the need to form a united front to win in the general election. Backing the factional candidate will not bring victory, which in turn will not bring about the faction’s preferred policies.

There are a number of ways to measure such factionalization. A variety of techniques exist to identify communities in a network. The degree to which a given set of communities divides the network can be characterized by its modularity (described more below). This gives us our first hypothesis. If the network theory is correct:

H1: The network will not be easily divided into large factions or modular communities. Modularity of any factions will be minimal, and the factions small.

4.3 Centrality

Secondly, if the key determinant of participation in the party network is a desire to coordinate, then it should still be the case that individual actors vary in this desire. Some will tend to endorse mainstream candidates who go on to win the nomination (perhaps, as CKNZ argue, as a result of their coordination), while a smaller, more marginal group will endorse fringe candidates. If coordination is the main focus, we should expect mainstream and especially successful candidates to be more centrally located in the network. Thus:

H2: Successful candidates will have higher measures of centrality in the network.

Evidence for a similar proposition appears in CKNZ They show that the candidate who has the most endorsements tends to win the nomination, controlling for polling, media coverage and fund-raising. They also show that the effect is stronger for “repeat” endorsers, which they call the “pond” after the small pond of central actors. However, merely repeating is not the best evidence of centrality in the endorser pool. Centrality measures of the network should add needed leverage. There are numerous measures of “centrality” in social networks analysis, discussed below.

5 The Network Structure of the Data

These data can be represented as a network in several ways. The most natural is a bipartite network or two-mode graph, which links two kinds of nodes, endorsers and candidates. All ties begin with an endorser

and go to a candidate. Each actor must belong to one of the two kinds of nodes. When a candidate later endorses someone (either in the same contest or, more common, a different one), that actor appears in the dataset twice, once as an endorser and once as an endorsee. So, for instance, Bill Clinton is a candidate in 1992, but he also endorses Hillary Clinton in 2008. In that case, a separate Bill-Clinton-as-endorser node is created. It is assumed that all such actors also “endorsed” themselves.

Bipartite networks can be useful to visualize the relationships that create the network. However, many common network measures cannot be computed on them. It is thus common to convert two-mode graphs to one-mode graphs. Two such one-mode graphs can be created here: a candidate-by-candidate graph and an endorser-by-endorser graph. In the former, two candidates are said to have a tie if they have an endorser in common. Thus, because then-New York Governor Mario Cuomo endorsed Mondale in 1984 and Dukakis in 1988, Mondale and Dukakis have a tie. In the latter, two endorsees are said to have a tie if they both endorsed the same candidate. So Cuomo and U.S Representative Barney Frank (D-Mass.), who both endorsed Dukakis, are linked to each other.

Both of these networks are worth exploring. The endorser-by-endorser network more directly captures the notion of a the party as an informal network. However, the method of making the connections will necessarily create clusters of endorsees around each popular candidate. Communities may also be hard to interpret, since it is the candidates whom we know much about. The candidate-by-candidate network, on the other hand, may be more easily interpreted, but the network is much smaller. It also links candidates through the actions of a third party, over whom they have no direct connection. Of course, all three ways of organizing the network will be mathematically related and likely to lead to similar inferences.

6 Graphing the Networks

Before turning to the hypotheses, I present illustrations of the networks. Figures 1 and 2 show the bipartite network of the Democratic and Republican endorsees and endorseees. Rather than use a distance algorithm, the candidates are located substantively, arranged by year across the x-axis and by the centrality of the candidates on the y-axis. Endorsees are located between their endorseees, and their locations have been jittered.

[FIGURES 1 AND 2 ABOUT HERE]

These figures illustrate the connections across years in both parties. Most of the connections are among the major candidates, near the bottom. It is possible here to trace out interesting patterns. For instance,

note the extensive draw of support for Gore in 2000, from those who endorsed a variety of candidates in earlier contests, and who would go on to endorse a variety in later contests.

But the bipartite graph only goes so far in showing the relationships among the candidates and among the endorsers. I turn now to the one-mode networks that can be constructed from the bipartite graphs. First, Figure 3 shows the Republican candidate-by-candidate network, and Figure 4 shows the Democratic candidate-by-candidate network. There is a tight knot in the center of both graphs. From year to year, a handful of candidates are connected by receiving many endorsements from the same core of endorsers. The candidates on the fringe of the network are those who are also most generally thought of as fringe candidates — less successful with voters as well as with elites. This is especially true for the Democratic network.

[FIGURES 3 AND 4 ABOUT HERE]

Also clear from the Democratic network is that a few candidates are completely isolated from the network: McCarthy in 1972 and Wallace in 1972 and 1976. This may in part be due to the fact that both of these candidates come from the very beginning of the time series, so many of their endorsers drop out of the network. In fact, however, neither candidate received many endorsements at all. Their isolation reflects the more fragmented nature of the party at that time. Both McCarthy and Wallace were not mainstream candidates in the crowded 1970s fields. In some later analyses, including the coming endorser-by-endorser graphs, these separate networks will be removed.

Turning to the endorser-by-endorser networks, we can see that common endorsement of high-profile candidates creates knots of connection. Figures 5 and 6 present these for the Republican and Democratic parties. These knots are of interest — what, if anything, do the endorsers of a particular candidate have in common. But more central for this project is the connections among endorsers from endorsing more than one candidate in common, or from their connections across different periods.

[FIGURES 5 AND 6 ABOUT HERE]

Endorsers of the major candidates in 2008 are in color in these figures. Studying these figures, a few things jump out. In Figure 6, the endorsers for McCain, Romney, Giuliani and Huckabee all appear to be on the outer edge of the network. This is largely because many of their endorsers were unique to 2008, and so are peripheral. The story is slightly different on the Democratic side. Obama's cluster does appear to be more peripheral in Figure 5, but this is in part due to the randomness in the plotting algorithm. Still, Clinton's cluster is more embedded in the network.

These patterns depend on the large number of endorsers who participate in only one contest. Those who endorse only one candidate are connected to the others who endorse that candidate, but to no one else. These one-timers are interesting, but the party network is defined by those who participate more than once. It is thus worthwhile to consider only those repeat endorsers, who are presented in Figures 7 and 8.

[FIGURES 7 AND 8 ABOUT HERE]

Now the network appears much more dense. There are almost no discernible clusters, and the endorsers for major candidates (such as the 2008 candidates highlighted in color) are spread throughout the network. The impression of these figures is of a single, well-integrated party network.

7 Testing Hypotheses

Visualizing the relationships among nodes is a key asset of graph theory. But specific hypotheses need sharper tests than a visual impression. I turn now to such tests.

Hypothesis 1 claimed that, if the network is to be thought of as a party, then it should not be easily broken into subgroups. It should not be especially factionalized.

To test this hypothesis, we need to identify factions in the network, and then determine how well those factions divide the network.

There exist a large number of ways to identify subgroups in a network. While I have explored several, I will discuss here walk-trap community detection. This technique works from the assumption that short walks from node to node along their edges will tend to stay in the same community. Having identified small clusters in this way, we can proceed step by step to connect them to their neighboring clusters, until we eventually have the entire network linked.

At each step of that process, we will have divided the network into some number of communities. How well we have divided them is a separate question. For any given division, we can measure the “modularity,” or how well the division separates the vertices in each grouping. The measure assesses how many intergroup and intragroup edges there are. The measure runs from 0 to 1, where 0 means the division is poor — there are as many intergroup edges and intragroup edges, while 1 is perfect division — there are no intergroup edges.

According to Hypothesis 1, if the network really is a party attempting to cooperate, factionalism among the endorsers should be low. Thus the modularity of attempts to find communities in the endorser-by-endorser graph should be low. If this modularity is politically significant — at least, if it is of the order of a

major schism in the party, it presumably represents a split into a small number of communities (rather than into dozens of very small groups).

Table 1 reports the modularity of the most modular possible communities. The value depends on how we present the network. The candidate-by-candidate network has very low modularity. Nearly every candidate is endorsed by many actors who also endorsed others, so there are many connections. But the endorser-by-endorser network has high modularity. As above, this is because of the many endorsers who only enter one contest. All of the actors who endorsed McCain in 2008 *and no one else* are connected to each other, but they are connected to only those repeaters who also endorsed McCain in 2008. In years where there are many such actors, those clusters represent distinct factions.

But such factions are an artifact of that behavior. Theoretically, the party network is made up of long-view players who participate repeatedly. When we restrict the analysis to those, we again find a very unfactional network. Notably, the Republican network is less factional than the Democrats (although that difference is not great), perhaps consistent with the observation that the Republican coalition has been more united in this period.

Table 1: Modularity of Most Modular Community Structure

Network	Democrats	Republicans
Candidate-By-Candidate	0.04	0.13
Endorser-By-Endorser	0.71	0.69
Endorser-By-Endorser (Repeaters Only)	0.30	0.08

Hypothesis 2 focuses on the important actors in the network. If the network is trying to coordinate, then the endorsers who are most central to the network — and thus most coordinating with others — ought to be the most valuable endorsers.

There are many ways of measuring “centrality,” or how well integrated a node is into the network. Degree centrality, a common measure, is simply the number of edges a vertex has, or how many ties the actor has to any other actor. A more nuanced measure of centrality is eigenvector centrality, which takes account of the centrality of the nodes to which each node is connected. Thus an actor’s eigenvector centrality is larger if it is connected to other actors that also have many connections.

Tables 2 and 3 report the 25 most central actors in the Democratic and Republican repeat-actor networks. It is important to consider only repeat actors because centrality can be influenced by the large knots identified in the previous section. For example, endorsers who endorsed only Gore in 2000 and Clinton in 2008 will appear very central, because of the very large number of endorser-to-endorser connections induced by those

candidates. But this allows for contamination of the underlying network by the candidate-centered also-rans, who are “allowed” to endorse, but do not (necessarily) represent the efforts of a stable network to control nominations.

[TABLES 2 AND 3 ABOUT HERE]

The lists in tables 2 and 3 match up to qualitative assessments of key players in the parties. Former South Carolina Gov. Carroll Campbell is a perfect example of a party leader who is influential even though he no longer holds public office. CKNZ cite his support, and the network of local South Carolina activists that came with it, as influential in Bush’s victory in the state in 1992 and Dole’s victory in 1996, despite both men’s lack of strong social conservative bona fides. Both lists include several presidential candidates (but, notably, not most) and major congressional leaders.

The Democratic list seems more diverse than the Republican lists. A few key organizations show up. Teachers unions and the AFL-CIO are central players in Democratic politics. The Democratic list also includes more local politicians. The Republican list includes many governors, a group CKNZ identify as especially influential in both parties, but the Democratic list has more diversity, including the mayor of Philadelphia and the Iowa attorney general. The Democratic list also drops farther on the Eigenvalue Centrality score to get 25 candidates. The 25th most central Democrat has a score of about 0.65, while the 25th most central Republican’s score is 0.801. This perhaps reflects the slightly more fragmented nature of the party, with fewer actors concentrated in the center.

If these actors are especially influential, we would expect the candidates they endorse to win. The eventual winners in the contests are in bold in tables 2 and 3. They are mostly on the winning side. Notable exceptions include African American politicians supporting Jesse Jackson and a handful of candidates who back one candidate before switching to the eventual winner when their primary candidate drops out. That might be evidence of following the bandwagon, although it’s important to note that these switches occur before Iowa, so the bandwagon is rolling before any voting occurs.

The most significant failures occur in 1988, 2004 and 2008 for the Democrats and in 2008 for the Republicans. These are cycles marked by a general failure to coordinate.

Beyond the endorsers listed in tables 2 and 3, we might ask how closely related centrality is to success. Figures 9 and 10 plot the relationship between the percent of an endorser’s choices who go on to win the nomination and the centrality of those endorsers. The pattern is what we would expect. At the low end, the success rates run the gamut, from always losers to always winners. If elite endorsers send a signal to less

important endorsers, then some small fish will hear that signal. But the more central endorsers are more often successful.

[FIGURES 9 AND 10 ABOUT HERE]

We might also turn our focus to the candidates. If endorsements have any causal value, successful candidates will be those who are most connected into the endorser-created network. And they will receive more endorsements from more centrally connected endorsers.

Again, we might consider many measures of centrality. Here, degree centrality is equivalent to counting the number of endorsers who have also endorsed another candidate. CKNZ do exactly this when they looked at repeat endorsers. Confirming their finding, Figures 11 and 12 plot the degree centrality of each candidate in the candidate-by-candidate network for each contest. Eventual winners are labeled, and other candidates are indicated with a dot. That is, it shows which candidates are most connected to other candidates through their endorsers. Candidates with high degrees represent continuity with previous and future candidates. They are the insiders, as defined by a persistent grouping. Eventual winners are named.

[FIGURES 11 AND 12 ABOUT HERE]

As with the endorsers, eigenvector centrality might be more meaningful. It captures not just the raw number of endorsements, as in CKNZ, but also something about who endorses. In particular, it values links to other candidates who are themselves popular, which is to say endorsements from those who also endorsed other popular candidates within the party. Figures 13 and 14 plot that measure.

[FIGURES 13 AND 14 ABOUT HERE]

Insiders tend to win. Of the Republicans, all but two of the top eight are winners. And the two winners who have low degree are simply anomalies. Bush in 1992 and Reagan in 1984 were obviously insiders — they were incumbents. They score low on centrality because almost no one bothered to endorse them in the primaries, as they faced no serious contest. Bush was challenged by Buchanan, but no one took this challenge very seriously. Reagan was unchallenged. They should perhaps not even be in the dataset, but their endorsers do help to tie together other actors in other periods, so they are useful for other questions.

Meanwhile the other two low centrality Republican candidates are meaningful. Ford was an incumbent challenged by Reagan in 1976, and his popularity was weak in the party. Republicans rallied around him, but their support was lukewarm. The same could be said of McCain's support in 2008. While he has a higher

degree than his 2008 rivals, the difference is not that great, as might be expected by his own lukewarm support from his party.

On the Democratic side we have a similar story. Most of the high centrality candidates are the eventual winners. The deviations from that pattern are also illustrative. Carter in 1976 and McGovern in 1972 were competing in the period immediately after the McGovern-Fraser reforms, and before most in the party had completely adapted to them. It's actually notable that McGovern has the highest degree of any 1972 candidate, as it was widely believed that Muskie was the inside favorite. And probably he was, but McGovern's supporters were perhaps more likely to continue to participate in the process. Like McGovern, Carter surprised the party with his out-of-nowhere showing. But that is something that candidates have not been able to do since 1980, when party leaders began coordinating before the primaries (Cohen et al., 2008).

Kerry's low showing in 2004 is also telling. Democrats in 2004 were hesitant to endorse anyone. Dean eventually pulled ahead in endorsements, but only after many in the party became convinced he would be the winner. They flocked to Kerry once Dean, who was a true outsider, faltered in early contests. (e.g. Koger, Masket and Noel 2009).

Finally, Barack Obama's low degree, and Hillary Clinton's high degree, are evidence of Obama's outsiderhood and Clinton's insider position. Obama surprised the party with his plurality finish in Iowa, and then party leaders moved to back him. His degree would be higher if those endorsements were included, but as noted above, that endogeneity might distort our interpretation.

8 Conclusions

This paper is a work in progress. But the findings so far are suggestive. The project needs to move forward in several directions. I outline three below.

First, more work needs to be done to describe the communities so far identified. In both parties, maximal modularity comes with the division into several communities, not two or three. If we divide the network into a smaller number of communities, one is clearly the dominant one, with others as the fringe. So the cleavage is not social versus economic conservatism. But the groups might be still meaningful.

Fortunately, there is data on the characteristics of the endorsers, notably their home state, their office and their ideological location. And of course the data includes their names, which might suggest other categories of investigation.

Second, a similar sort of analysis should investigate patterns in centrality. According the network theory

of parties, elected office holders should not be more important in the network than many informal actors (although truly informal actors, such as entertainers, should not be important).

Third, there are many tools that can speak to homophily. In particular, we have ideology measures for some of the endorsers. Endorsers with similar ideology traits might be likely to endorse the same candidates, but we would expect this finding to be small, in light of the need to form a united front around a candidate. If that is what they are doing, then we would not expect ideology to explain much. The fact that there is no persistent factionalism in the first place is only a first step.

Finally, this analysis could be brought more directly to bear on the argument I make with coauthors in CKNZ I find here that Obama is an outsider, while there we argued that his later endorsements suggested he was not. Those findings are based on different data — I omit all endorsements before Iowa, while there we argued that post-Iowa behavior reflected party strategy.

References

- Aldrich, John. 1995. *Why Parties? The Origin and Transformation of Political Parties in America*. Chicago: University of Chicago Press.
- Bawn, Kathleen and Hans Noel. 2007. Long Coalitions Under Electoral Uncertainty: The Electoral Origins of Political Parties. In *Midwest Political Science Association*. Chicago, Ill.: .
- Bawn, Kathy, Marty Cohen, David Karol, Seth Masket, Hans Noel and John R. Zaller. 2012. “A Theory of Political Parties: Groups, Policy Demands and Nominations in American Politics.” *Perspectives on Politics* 10(3):571–597.
- Bernstein, Jonathan. 1999. The Expanded Party in American Politics PhD thesis University of California, Berkeley.
- Cohen, Marty, David Karol, Hans Noel and John Zaller. 2008. *The Party Decides: Presidential Nominations Before and After Reform*. Chicago: University of Chicago Press.
- Desmarais, Bruce, Vincent G. Moscardelli, Brian F. Schaffner and Michael Kowal. 2012. “Meaningful Collaboration and Legislative Success in the U.S. Senate.” Working Paper.
- Doherty, Joseph. 2006. The candidate-consultant network in California legislative campaigns: A social network analysis of informal party organization PhD thesis University of California, Los Angeles.
- Dominguez, Casey. 2005. Before the Primary: Party Participation in Congressional Nominating Processes PhD thesis University of California, Berkeley.
- Heaney, Michael and Fabio Rojas. 2007. “Partisans, Nonpartisans, and the Antiwar Movement in the United States.” *American Politics Research* 34(4):431–464.
- Koger, Gregory, Seth Masket and Hans Noel. 2009. “Partisan Webs: Information Exchange and Party Networks.” *British Journal of Political Science* .
- Koger, Gregory, Seth Masket and Hans Noel. 2010. “Cooperative Party Factions in American Politics.” *American Politics Research* 38(1):33.
- Masket, Seth. 2009. *No Middle Ground: How Informal Party Organizations Control Nominations and Polarize Legislatures*. Ann Arbor: The University of Michigan Press.
- Monroe, J.P. 2001. *The Political Party Matrix: The Persistence of Organization*. Ithaca: State University of New York Press.
- Noel, Hans. 2006. The Coalition Merchants: How Ideologues Shape Parties in American Politics dissertation University of California at Los Angeles.
- Ringe, Nils and Jennifer Nicoll Victo. 2012. *Bridging the Information Gap: Legislative Member Organizations as Social Networks in the United States and the European Union,* (with Christopher J. Carman), University of Michigan Press, forthcoming. University of Michigan Press.
- Schattschneider, E.E. 1942. *Party Government*. Westport, CT: Greenwood Press.
- Schwartz, Mildred A. 1990. *The Party Network: The Robust Organization of Illinois Republicans*. Madison: University of Wisconsin Press.
- Skinner, Richard. 2005. “Do 527’s Add Up to a Party? Thinking About the “Shadows” of Politics.” *The Forum* 3(3):Article 5.
- Sundquist, James L. 1983. *Dynamics of the Party System: Alignment and Realignment of Political Parties in the United States*. Washington: Brookings Institution.

Figure 2: Republican Bipartite Graph

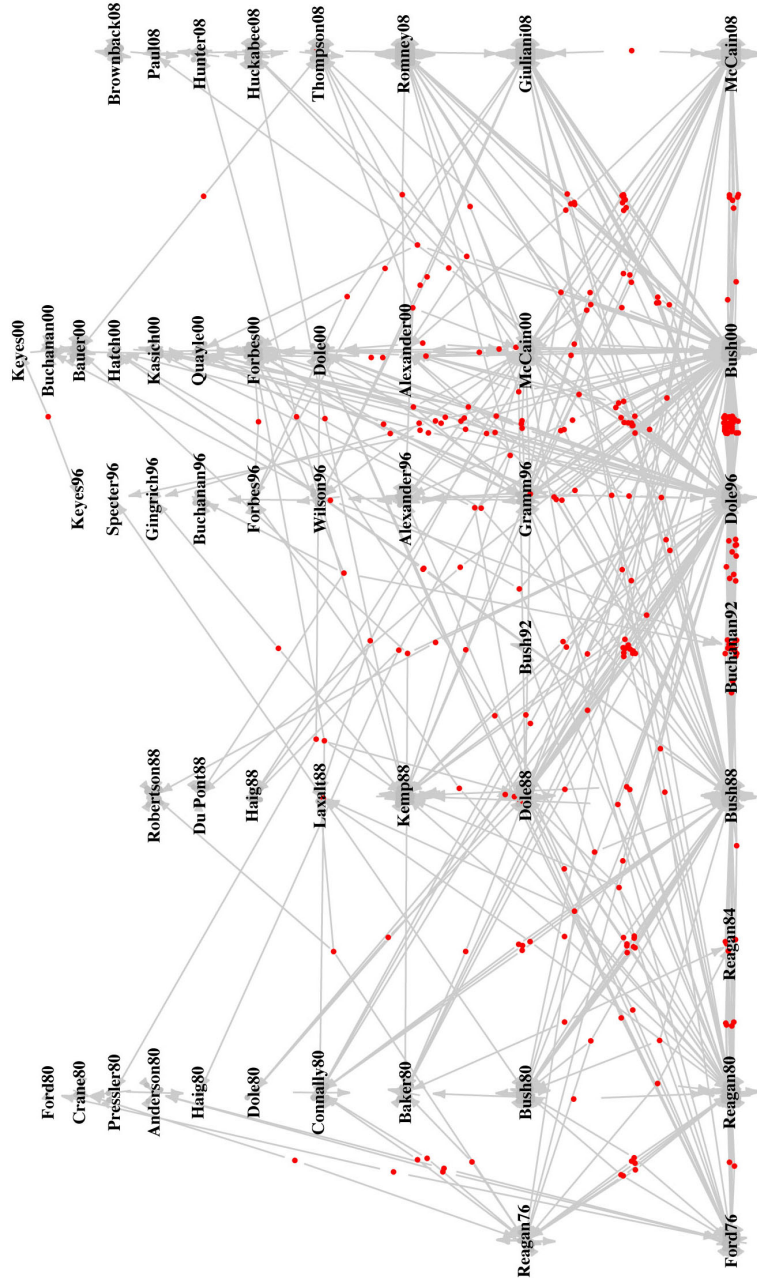


Figure 3: Democratic Candidate-By-Candidate Graph

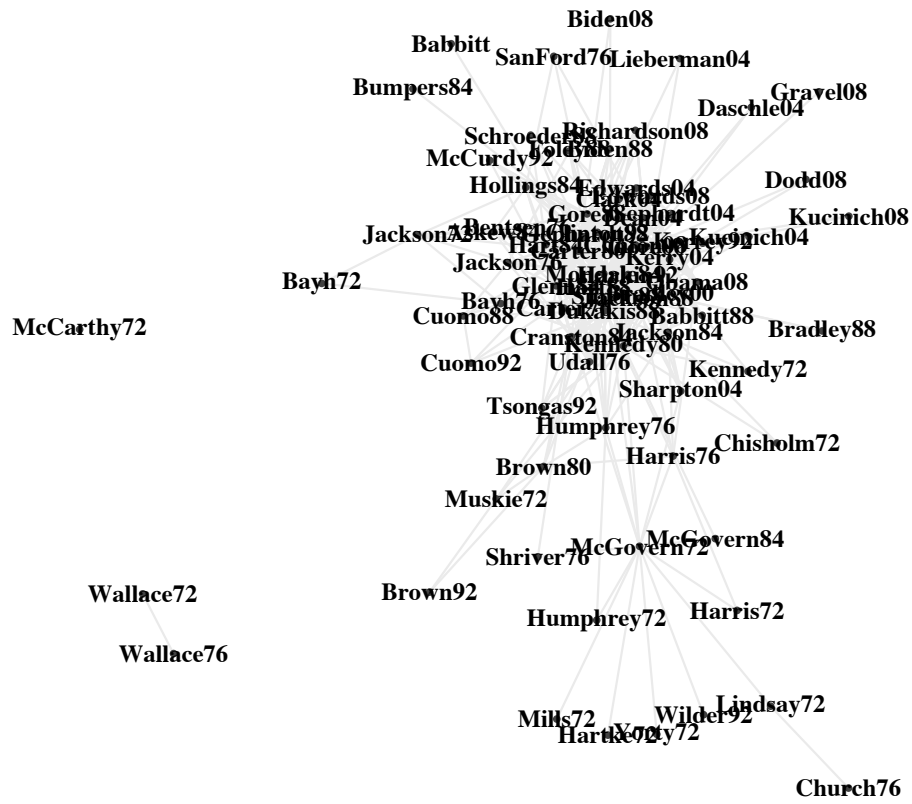


Figure 4: Republican Candidate-By-Candidate Graph

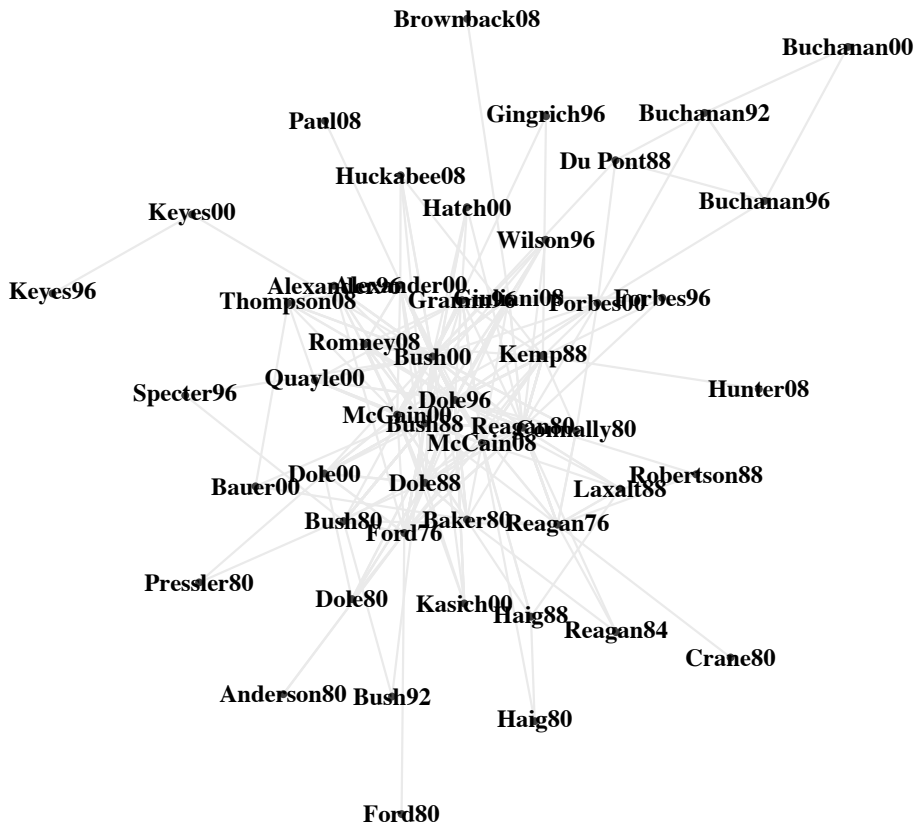


Figure 5: Democratic Endorser-By-Endorser Graph

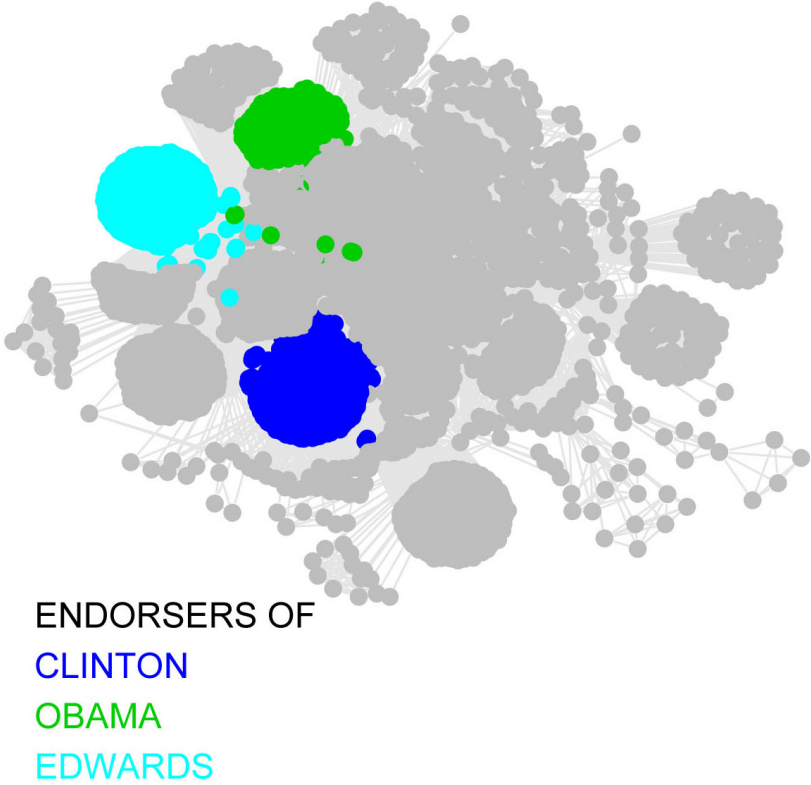


Figure 6: Republican Endorser-By-Endorser Graph

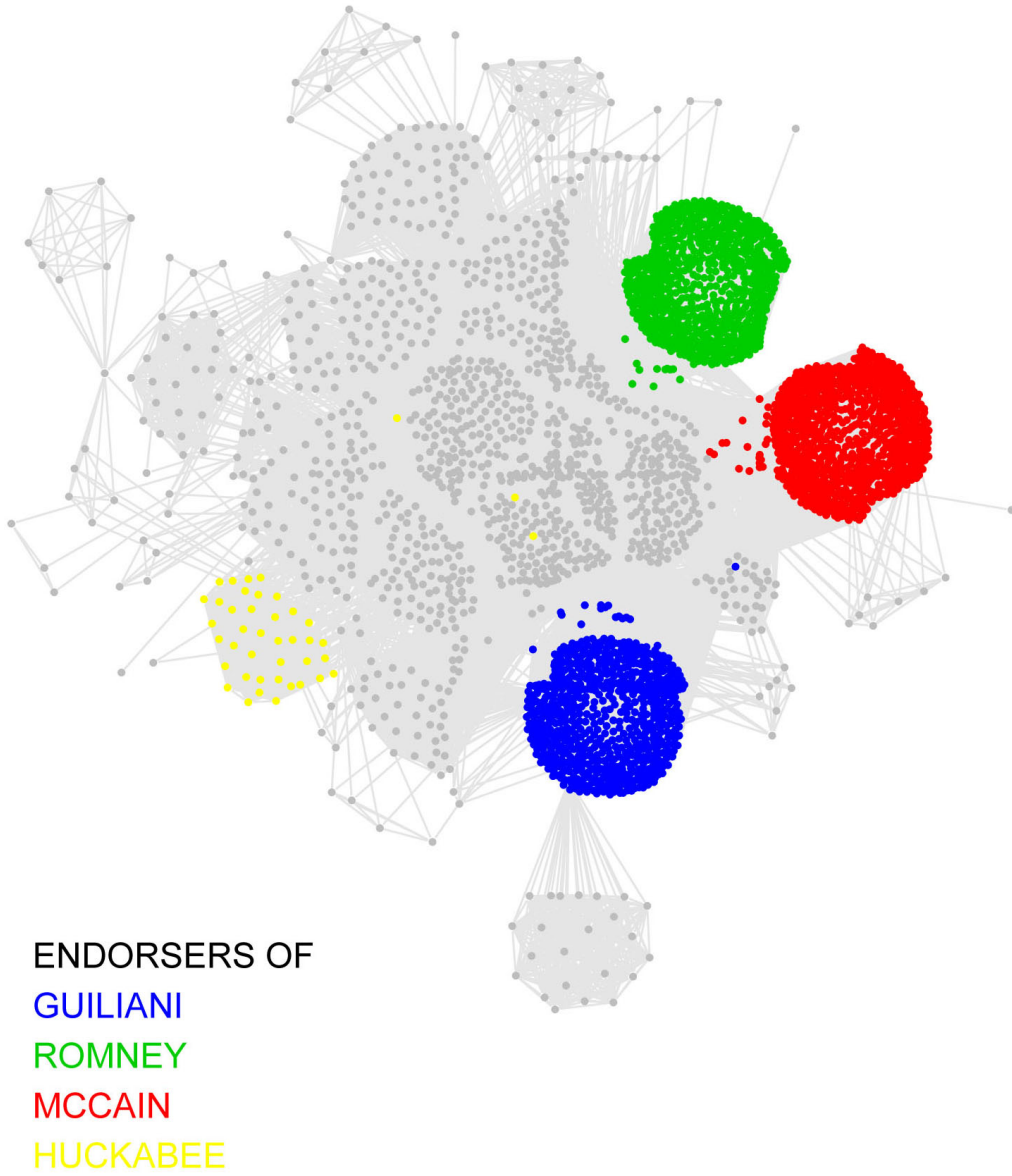


Figure 7: Democratic Endorser-By-Endorser Graph (Repeat Endorsers Only)

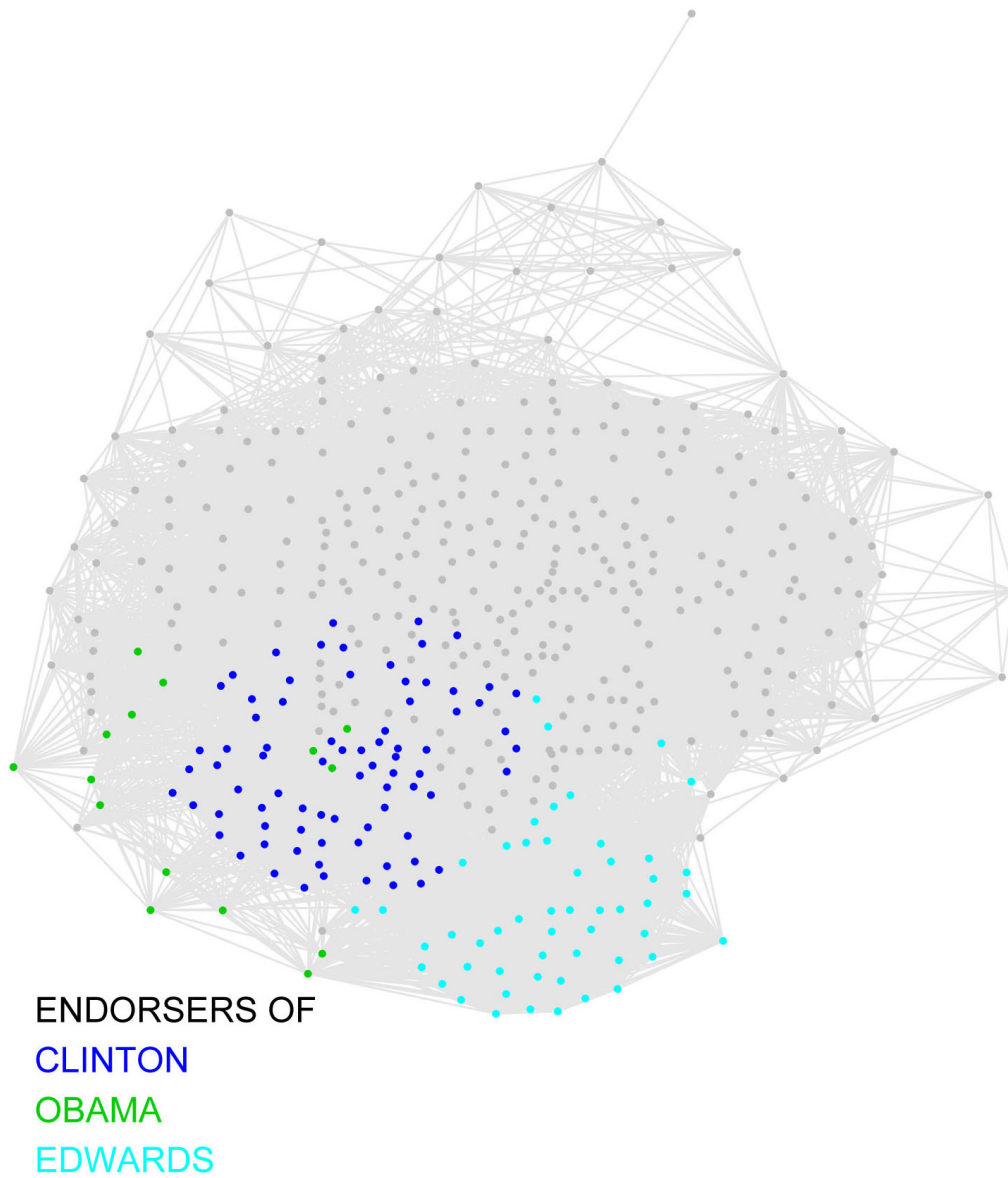
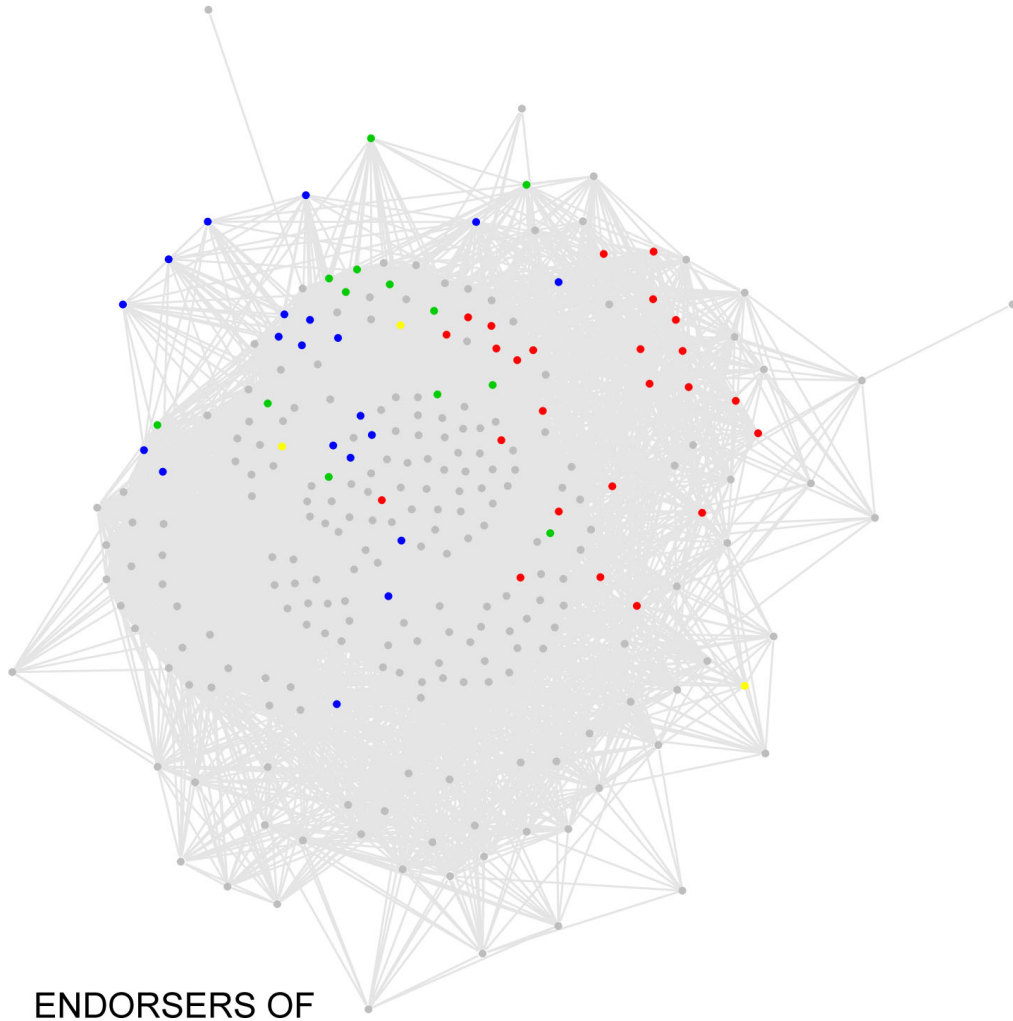


Figure 8: Republican Endorser-By-Endorser Graph (Repeat Endorsers Only)



ENDORSERS OF
GUILIANI
ROMNEY
MCCAIN
HUCKABEE

Figure 9: Democratic Success rate as a function of Eigenvector Centrality

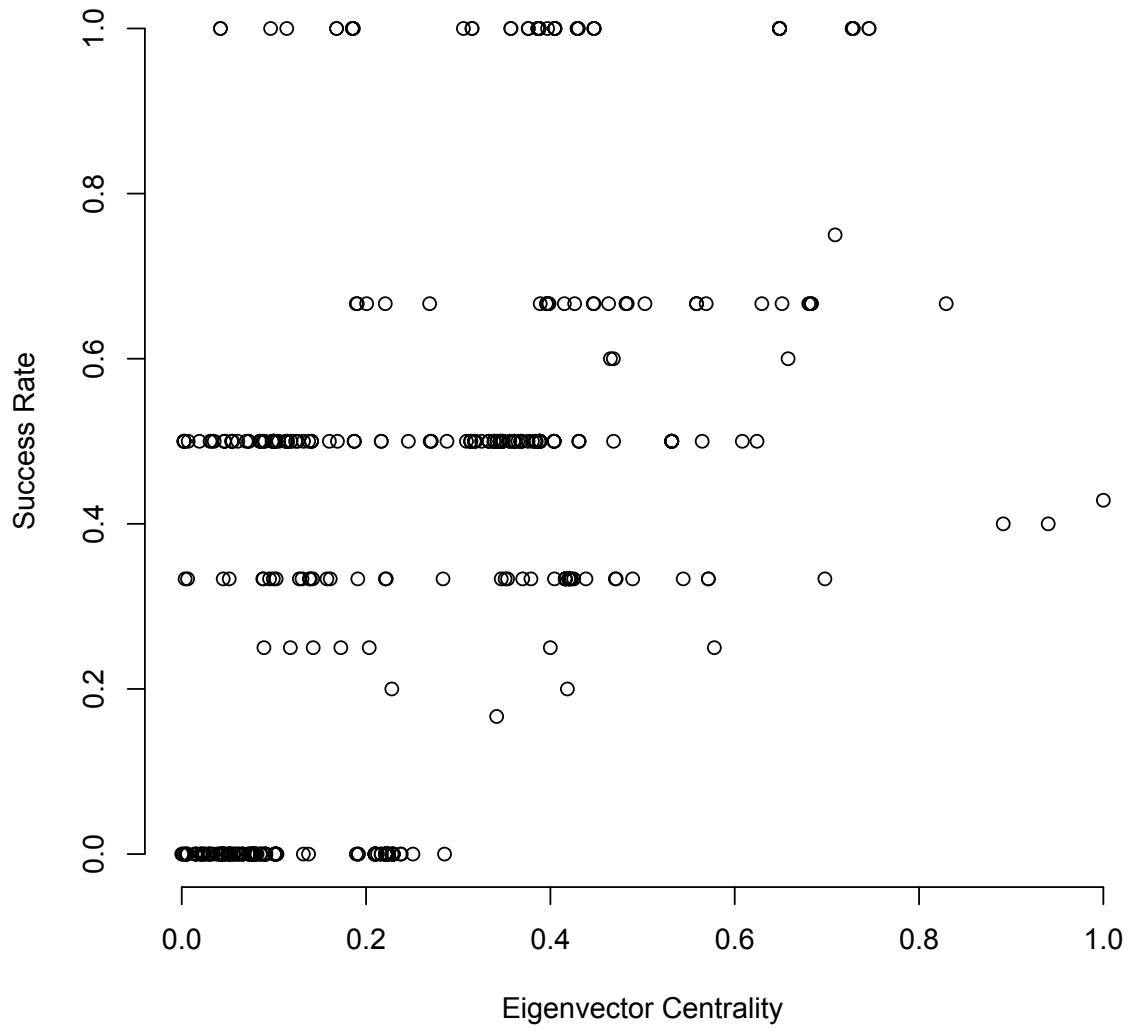


Figure 10: Republican Success rate as a function of Eigenvector Centrality

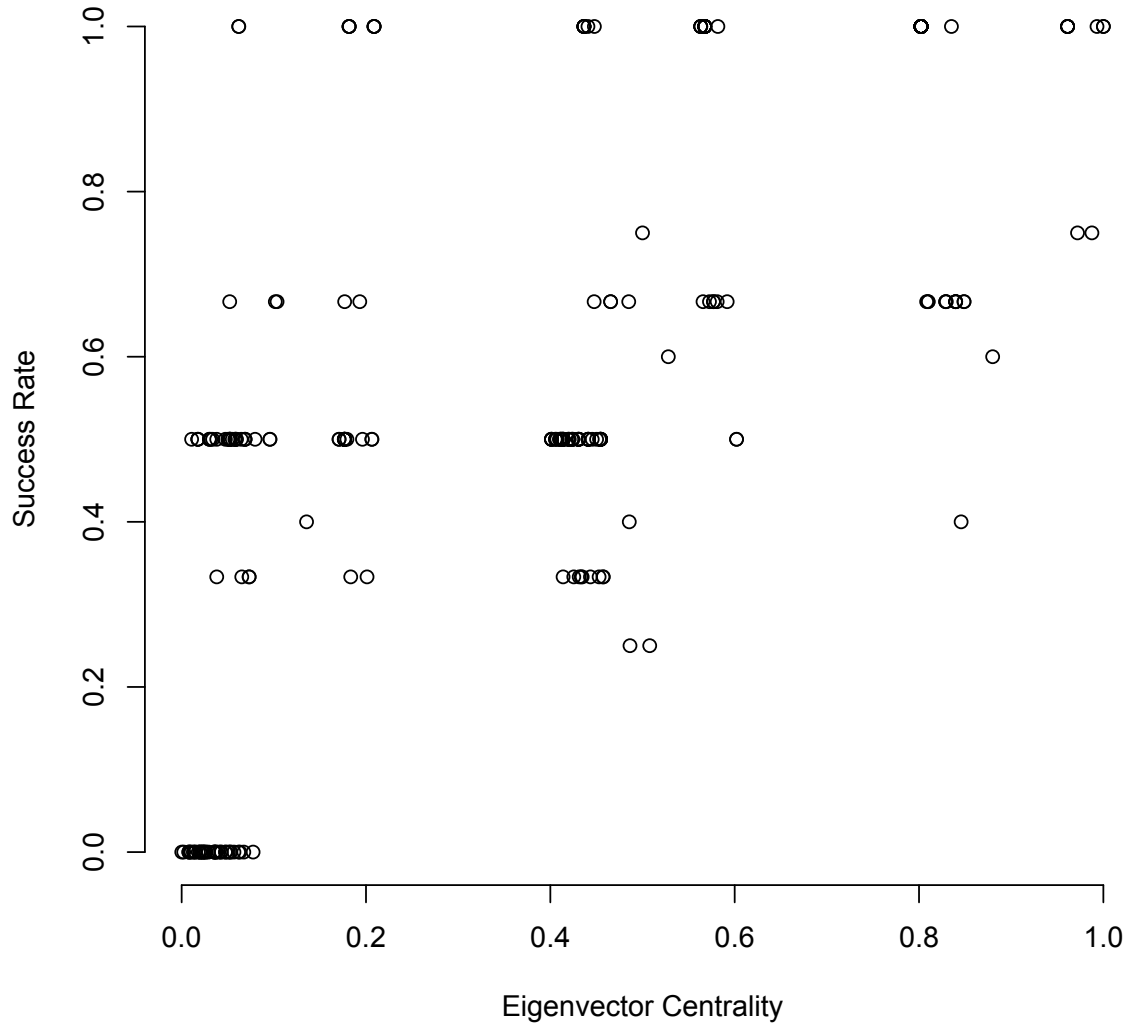


Figure 11: Degree Centrality of Democratic Candidates

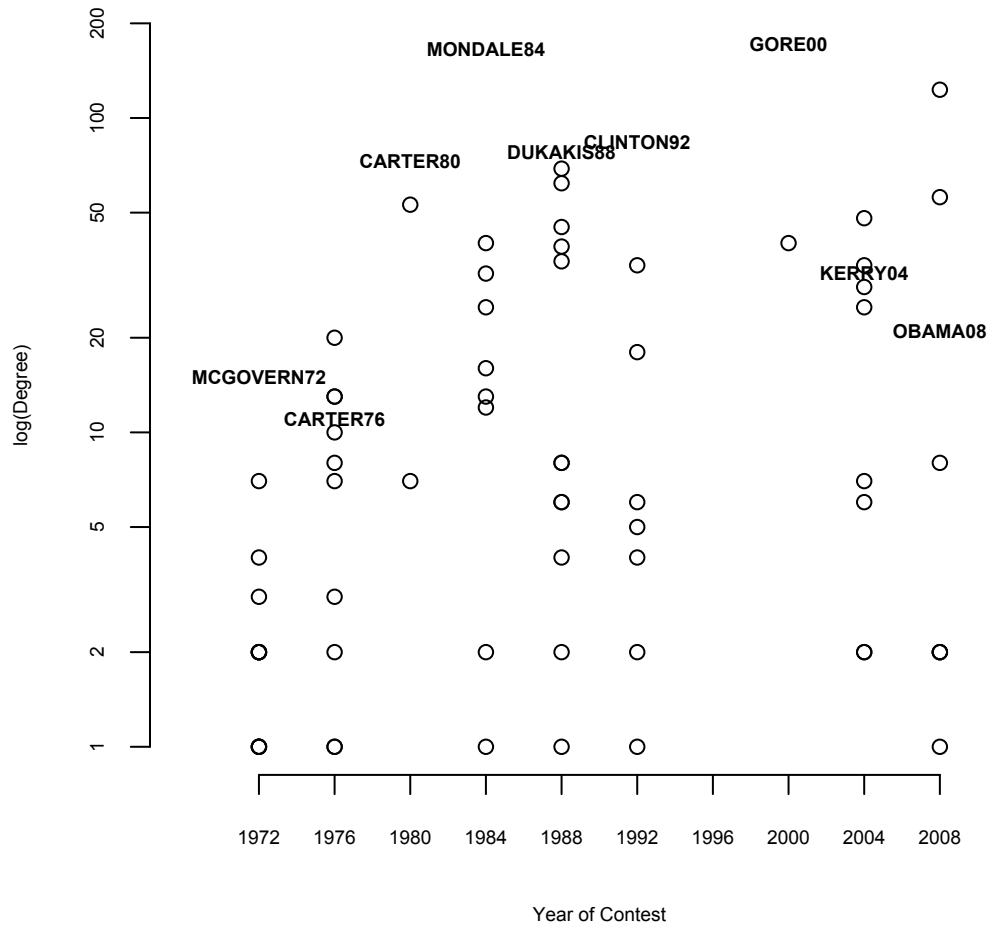


Figure 12: Degree Centrality of Republican Candidates

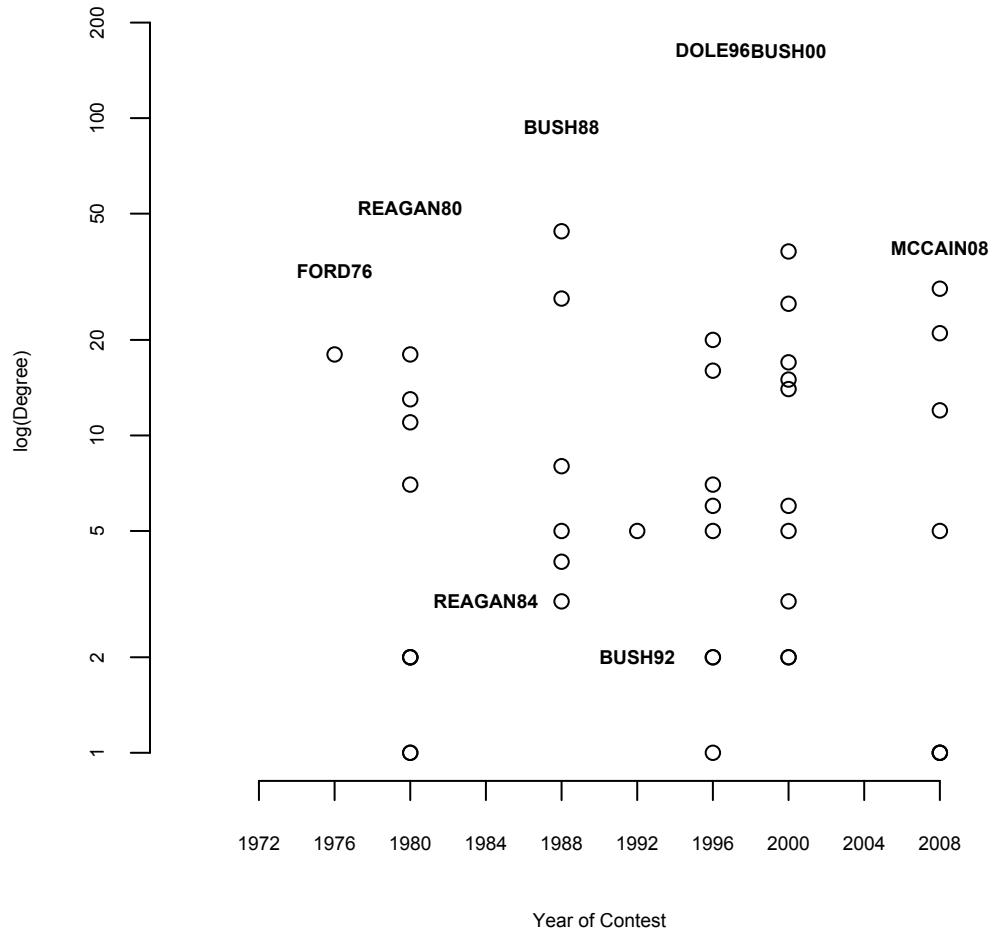


Figure 13: Eigenvector Centrality of Democratic Candidates

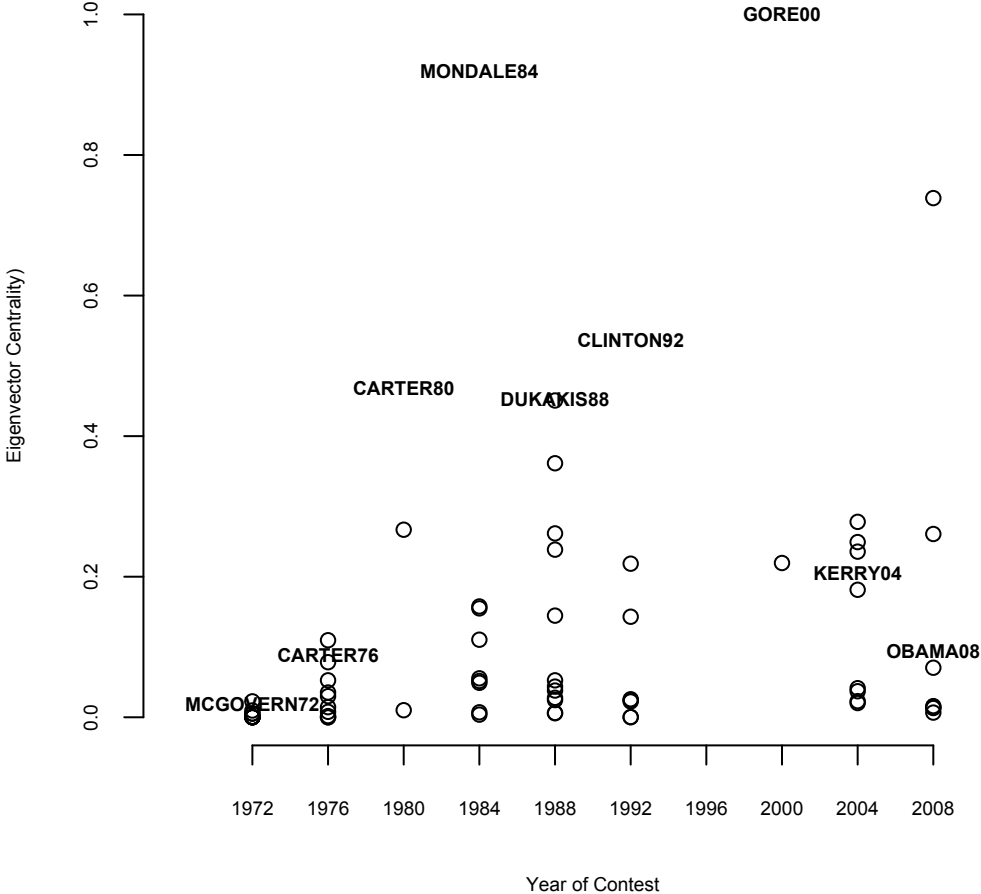


Figure 14: Eigenvector Centrality of Republican Candidates

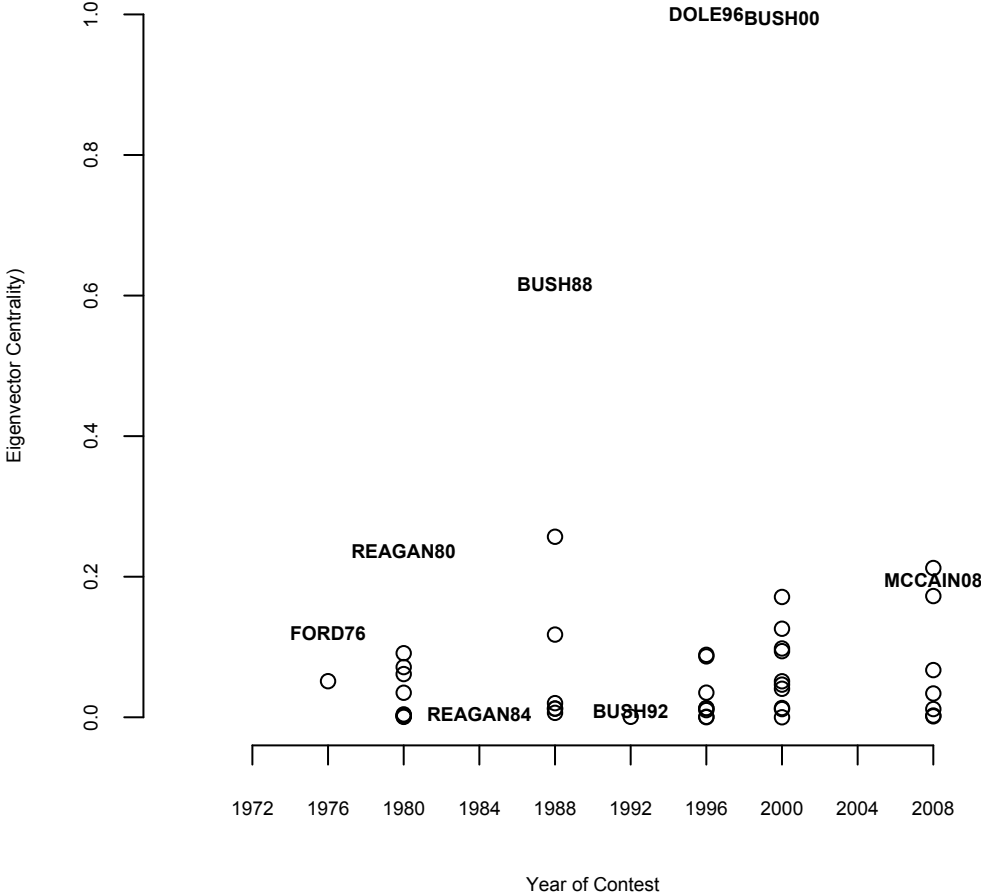


Table 2: Most Central Democrats

Eigenvector Centrality	Endorser	1976	1980	1984	1988	1992	2000	2004	2008
1.000	Charles Rangel, U.S. Rep. (N.Y.)		Carter	Mondale	Jackson	Harkin	Gore	Clark	Clinton
0.940	Dick Gephardt , U.S. Rep (Mo.)			Mondale	Gephardt		Gore	Gephardt	Clinton
0.891	Tom Harkin , U.S. Sen. (Iowa)			Mondale		Harkin	Gore	Dean	Clinton
0.830	Barbara Mikulski, U.S. Sen. (Md.)			Mondale			Gore		Clinton
0.746	John Lewis, U.S. Rep. (Ga.)			Mondale			Gore		
0.746	Tom Hynes, Cook County (Ill.) Assessor			Mondale		Clinton	Gore		
0.729	Dianne Feinstein, Sen. Calif.		Carter	Mondale		Clinton	Gore		
0.729	National Education Association		Carter	Mondale			Gore		
0.728	Bob Matsui, U.S. Rep. (Calif.)			Mondale	Dukakis		Gore		
0.728	Joe Moakley, U.S. Rep. (Mass.)			Mondale	Dukakis		Gore		
0.728	Michael Dukakis , former Mass. Gov.			Mondale	Dukakis		Gore		
0.709	Bill Clinton		Carter			Clinton	Gore		Clinton
0.698	Edolphus Towns, U.S. Rep. (N.Y.)			Jackson	Jackson	Clinton	Gore	Sharpton	Clinton
0.683	Norman Dicks, U.S. Rep (Wash.)			Mondale	Gore		Gore		
0.682	Steny Hoyer, U.S. Rep. (Md.)			Mondale			Gore	Gephardt	
0.680	Barbara Boxer, U.S. Sen. (Calif.)			Mondale	Simon		Gore		
0.658	Maurice Hinchey, N.Y. state Assemblyman			Mondale	Dukakis		Gore	Dean	Clinton
0.651	Tom Miller, Iowa Attorney General	Carter		Mondale	Babbitt		Gore		
0.649	AFL-CIO			Mondale			Gore		
0.649	American Federation of Teachers			Mondale			Gore		
0.649	Ed Rendell, Philadelphia mayor			Mondale			Gore		
0.649	James Moran Jr., U.S. Rep. (Va.)			Mondale			Gore		
0.649	Parris Glendening, Md. P.G. County Executive			Mondale			Gore		
0.649	Paul Sarbanes, U.S. Sen. (Md.)			Mondale			Gore		
0.649	Robert E. Rubin, Former treasury secretary			Mondale			Gore		
0.649	Sam Gejdenson, U.S. Rep. (Conn.)			Mondale			Gore		

Table 3: Most Central Republicans

Eigenvector Centrality	Endorser	1980	1988	1996	2000	2008
1.000	Carroll Campbell, former S.C. Gov.	Reagan	Bush	Dole	Bush	
1.000	Tommy Thompson, Wis. Gov.	Reagan	Bush	Dole	Bush	
0.993	Tom Ridge, Pa. Gov.		Bush	Dole	Bush	McCain
0.988	Judd Gregg, U.S. Sen. (N.H.)		Bush	Dole	Bush	Romney
0.972	Howard Coble, U.S. Rep. (N.C.)		Bush	Dole	Dole/ Bush	
0.961	Benjamin Gilman, U.S. Rep (N.Y.)		Bush	Dole	Bush	
0.961	C.W. Bill Young, U.S. Rep. (Fla.)		Bush	Dole	Bush	
0.961	James Thompson, former Ill. Gov.		Bush	Dole	Bush	
0.961	John Engler, Mich. Gov.		Bush	Dole	Bush	
0.961	John G. Rowland, Conn. Gov.		Bush	Dole	Bush	
0.961	Sherwood Boehlert, U.S. Rep. (N.Y.)		Bush	Dole	Bush	
0.880	Pete Wilson , former Calif. Gov.	Reagan	Bush	Dole	Bush	Giuliani
0.849	Charles E. Grassley, Iowa Sen.		Dole	Wilson/ Dole	Bush	
0.849	Frank Murkowski, Alaska Sen.		Dole	Dole	Bush	
0.846	Lamar Alexander , former Tenn. Gov.		Dole	Alexander/ Dole	Alexander/ Bush	Thompson/Giuliani
0.840	Jim Edgar, U.S. Sen. (Ill.)		Dole	Dole	Bush	Giuliani
0.840	Jim Ryan, Ill. Attorney General		Dole	Dole	Bush	Giuliani
0.840	Peter King, U.S. Rep. (N.Y.)		Dole	Dole	Bush	Giuliani
0.840	Jack Quinn, U.S. Rep (N.Y.)		Dole	Dole	Bush	McCain
0.835	Charlie Condon		Dole	Dole	Bush	Romney
0.830	Joe Knollenberg, U.S. Rep. (Mich.)		Dole	Dole	Bush	
0.829	Bill Zeliff, former U.S. Rep. (N.H.)		Dole	Dole	Alexander/ Bush	
0.829	Terry E. Branstad, Iowa Gov.		Dole	Dole	Alexander/ Bush	
0.810	Strom Thurmond, U.S. Sen. (S.C.)	Connally		Dole	Bush	Thompson
0.810	Thad Cochran, U.S. Sen. (Miss.)			Dole	Bush	