

**A Longitudinal Analysis of Interest Group Influence in Retirement Policy**

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In this paper, I explore some of the political outcomes of networked relationships within a policy domain. Specifically, the outcomes for this paper are an organization's propensity to testify before a congressional committee, the number of times an organization is mentioned in a major U.S. newspaper or wire service story, and the selection of proposed legislation for lobbying. These outcomes I have collectively labeled as 'influence'. The broad research question of this paper is whether relationships matter for influence in interest group politics.

This paper looks at influence from a network perspective using two different applications. In the first, influence consists of being selected to provide information, which is both a tool of influence and an indicator of influential status, and I use congressional testimony and being quoted in the news media as case studies. Does working with others or being highly connected to others lead to being selected? The second application involves influencing the agenda of other lobbying organizations. Do the choices of one lobbying organization affect the choices of another organization? While in both cases I use longitudinal data and network analysis methods, I rely on traditional statistical regression for the first approach but use a relatively new dynamic model of network change for the second application.

The discussion in this paper will begin with a review of prior work on influence, which work shows the difficulty of defining and operationalizing influence. I then discuss the main argument of this paper as well as hypotheses that follow from the broad argument regarding networked relations and influence. I next discuss how I operationalized the idea of influence and review the applicable methodology. This paper uses longitudinal data from a single policy domain, which is federal retirement policy. The policy domain is reviewed in terms of the characteristics of the participating organizations, and I then present and discuss the main empirical results. The paper concludes with some thoughts about the nature of influence in the context of the prior paper's empirical findings.

## **Influence**

The issues of political power, access, and influence have been theoretical and empirical puzzles for quite some time (Hunter 1953; Dahl 1961; Bachrach and Baratz 1962). The explosion in interest group activity beginning in the 1960s convinced many scholars in political science that interest groups do, in fact, have influence over the political process (see, for example, Salisbury 1992; Arnold 1990; Wilson 1974; Berry 1999; Smith 2000). But despite the plethora of studies on lobbying, there are few conclusions about the nature and processes of influence. “The literature on influence is an interesting example of avoidance based on a recognition that previous studies had mostly generated more smoke than fire, more debate than progress, more confusion than advance” (Baumgartner and Leech 1998: 13).

A problem with studying influence is that there is little agreement on the definition and nature of influence. Each study produces its own definition of influence, which in turn means that each definition has its own measure for empirical study. Is influence the ability to change the contents of a bill? Is influence the power to change a legislator’s vote? Because of data availability, roll call votes are a popular method of studying influence, but studies have not produced agreement on how interest group activities generate changes in roll call voting (Smith 1995). Most scholars agree that if legislators are influenced by interest groups at all, they are least likely to be influenced when votes are cast (Baumgartner and Leech 1998), which places a focus on the development of legislative proposals and the overall policy agenda. A second area of focus for prior studies has been on campaign contributions from political action committees. But here again, the large number of studies have produced contradictory findings most likely because there are a wide variety of resources available to politicians other than PAC money (Cigler 1991).

I suggest that influence is a form of capital, perhaps political capital. And like financial capital, human capital, and social capital, influence can be created from a variety of sources, stored, and then expended or used for different purposes. Influence can be created from financial sources, expertise over an issue, credibility, and persuasiveness through interpersonal relations, to name a few. Influence can then be applied to enhance the public visibility of a group, gain access to important meetings, engage in

gossip, and thereby help shape the content of policy products. This study argues that social capital translates into political influence.

Robert Salisbury (1994) criticized influence studies because they treat politics as a game with clear winners and losers when in fact the political process often continues without either a discernable endpoint or winner, with even the rules of the game evolving over time. With this admonition in mind, it might be better to view influence, at least in some political contexts, not so much as an input that creates a political output but rather as a signal (Spence 1976) or mark of status (Podolny 1993) within a political domain characterized by a set of relations. A signal is usually defined as an indicator of quality that has two criteria: the signal must be at least partially manipulable by the actor and the difficulty of obtaining the indicator must be inversely related to the level of quality (Spence 1976). Lobbying organizations have some control over their reputations, and a reputation for influence is more difficult to obtain if you are not a “player.” Status in turn can be defined in this context as the perceived quality or importance of that actor’s previous contributions to prior iterations of the game of politics (Podolny and Stuart 1995).

Influence as signal or status can be contrasted with power. Weber (1978) defined power as the probability that one actor in a social relationship will be able to carry out his own will despite resistance. Few lobbying organizations have actual power in this sense of the word. On the other hand, influence can be direct and/or indirect. One can observe another’s influence even when the other does not act, and if actors perceive influence as real, then influence will be real in its consequences (Thomas and Thomas 1928).

Because of the role of perceptions, influence might be thought of as a concatenation of mechanisms (Gambetta 1998) that creates and reinforces a hierarchy (Podolny 1993). High status actors can become focal points (Schelling 1960) for the allocation of resources by the broader array of actors within or around the policy domain (Podolny and Stuart 1995). Those lobbying organizations with high influence may become the leaders of coalitions or be quoted more often by journalists, and prior leadership and media mentions beget additional status or influence. A “Mathew Effect” may thus take hold in part

because influence-as-status engenders a self-fulfilling prophecy with respect to the contribution of the lobbying organization (Merton 1968; Podolny and Stuart 1995).

### **Core Argument**

The main argument of this paper is that *lobbying organizations increase their influence in a policy domain when linked to a group network formed around close-knit ties*. In specifying what leads to access or influence researchers tend to focus on organizational resources or policy preferences. “Groups that seek influence must have the kind of costly resources that enable them to know, to attain, to frame, and to deliver the sort of political and policy information (and interpretations) that are relevant to the goals of those legislators who have the power to make decisions that affect policy (Leyden 1994; Austin-Smith and Wright 1992). Organizational attributes and resources are no doubt important. However, I argue here that an organization’s resources include social relations within the policy domain, which relations lower the costs of search and operation of influence (Uzzi 1997).

For example, if a congressional committee is holding a hearing on an important issue, how do lobbyists get invited to testify or more accurately, have their requests to testify accepted? Usually there are more lobbyists wishing to testify than available slots. Lobbying organizations spend considerable time establishing ties with committee staffers and/or members of Congress in order to convince them that the information they wish to convey is relevant or important to the hearing proceedings. The importance of prior and repeated contact, in terms of months or years in advance, is stressed by researchers in political science (Leyden 1994). When a congressional staffer has to find witnesses for a hearing, she wants assurances that a witness has credibility and will behave in the way the staffer and her boss desires. While organizational attributes certainly are important, prior contacts and an organization’s network position provides important signals that lower the search costs (“Who can I call?”) and operational costs (“Will they say and do what I want them to? Are they representative of a broad perspective?”). Specifically, I expect that long-term organizations that are more centrally located in their network to have better access to information, be perceived as more representative, and hence be more attractive as a potential witness.

An alternative way to think about network position is that position may be less about access to information or resources and more about freedom of action. A lobbying organization that is highly constrained by its ties to other organizations may have little latitude in presenting information that elevates it above those other organizations. Moreover, a committee seeking witnesses may want only organizations that stand out and that can reliably deliver testimony that suits the purposes of the committee chair. If A, B, C, and D are tied to each other in dense networks, why pick A when you can pick B, C, or D?

On the other hand, representativeness in terms of networked relations may also affect influence. An organization that has a high degree of similar interests with organizations is likely thought to be representative of all the issue preferences of active lobbying organizations. An organization with an agenda that overlaps with a number of other organizations may indicate both an organization's expertise in the policy domain and its representativeness.

In summary, superior network position would be an important factor to congressional staffers who are looking for witnesses.<sup>1</sup> A parallel line of reasoning runs for other types of influence activities, such as appearing in the news media. Thus, *hypothesis 1 states as follows: As an organization's network position improves, the organization will have more influence.* Social relationships and positions within the web of group relations have an effect on who gets asked to testify or quoted in the news media. In either case, congressional staff or reporters are looking for trusted sources of information much. Moreover, prominence at some level of interaction is likely to be attractive as the consumers of news will recognize the group. In testing hypothesis 1, I would expect to see the following:

- The greater the central position of an organization within its policy networks, the more likely that organization will be asked to testify or get mentioned in the news media. In general, centrality is a measure of network prominence that indicates actors with many ties. This study will use a

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<sup>1</sup> This can clearly be an iterative process or feedback loop in that some success at influence however conceptualized may improve social network position. To save space, however, I do not go into any iterative mechanisms here.

particular measure of centrality known as betweenness centrality.<sup>2</sup> Betweenness centrality is a measure of the proportion of paths linking all actors in a network that pass through a particular actor.<sup>3</sup> In general, betweenness centrality measures information control (Borgatti et al. 2002), which seems particularly apt for a study of lobbyists.

- The greater the constraint on a lobbying organization in terms of its membership relations, the less likely that organization will be asked to testify or get mentioned in the news media. The constraint measure is based on Burt's (1992) notion of structural holes, and constraint measures the extent to which an actor is invested in other actors who in turn are invested in each other. If I have ties to a group of people, and those people only have ties to each other, I will be highly constrained in my network. Conversely, if I have ties to different groups who are not tied to each other, I will not be constrained in my actions and indeed have the flexibility to engage in a number of roles such as a broker or representative.
- The higher the organization's agenda overlap, the more likely that organization will be asked to testify or get mentioned in the news media. A measure related to network position but somewhat distinct is agenda overlap. Taken directly from lobbyist disclosure reports, agenda overlap is an expression of common or similar issues between any two lobbying organizations. Agenda overlap is a measure of the number of issues two organizations have in common divided by their total set of issues. More specifically, the agenda overlap index is equal to the total number of common issues between organizations  $i$  and  $j$  divided by the square root of the product of the total number of issues each for  $i$  and  $j$ . Constructed in this way, the measure provides an index ranging from 0 to 1. An organization that has a high agenda overlap number averaged over all

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<sup>2</sup> A number of network measures are also available, but they are not appropriate or duplicate the measures actually used. For example, betweenness and closeness centrality are appropriate for directed networks rather than the affiliation networks that I focus on here. Moreover, using measures like the  $k$ -core did not add to the statistical models of Chapter 4.

<sup>3</sup> More specifically, let  $b_{jk}$  be the proportion of all paths linking nodes  $j$  and  $k$  which pass through node  $i$ . The betweenness of node  $i$  is the sum of all  $b_{jk}$  where  $i, j$  and  $k$  are distinct. Betweenness is therefore a measure of the number of times a vertex occurs on a geodesic. The normalized betweenness centrality is the betweenness divided by the maximum possible betweenness expressed as a percentage.

organizations therefore is representative of all the issue preferences of active lobbying organizations. In addition, a high agenda overlap measure may indicate an organization's expertise in the policy domain.

- The more coalitions in which an organization participates, the more likely that organization will be asked to testify or get mentioned in the news media. It was difficult to find coalitions that existed over the time period of this study. In order to provide a proxy for these conditions, I have collected data on coalitions that were visible and had an identifiable membership. Such coalitions are likely to be more formal in terms of rules and norms among participating organizations than informal exchange relationships. This measure was created by researching various websites related to retirement policy and finding information produced by coalitions devoted to retirement policy.<sup>4</sup> I used qualitative information from interviews as well as from internet archives (www.archive.org) for this search and was able to identify 31 coalitions from 1998 through 2004 for which membership information was available. The coalition variable focuses on an organization's participation in group activity. The variable for coalitions is a continuous variable counting the number of coalitions in which an organization is a member over a particular period of time. I focus on the number of coalitions rather than a dummy variable for any participation in order to capture the level of coalition activity.

In addition, I would expect that joint activity in the form of coalition participation would be influential as well. The very purpose of participating in coalitions is to elevate the issues of common interest as well as to raise the profile of participating organizations. Participation in a coalition or across coalitions may signify an organization's interest in an issue as well as the gravity of the issue itself. If an organization participates in more coalitions, it seems reasonable that its prominence would be higher among other lobbying organizations and policymakers. *Hypothesis 2 states that the more coalitions in which an organization participates, the more influence that organization will possess.*

Information about organizations other than one's own is crucial; however, if information is not

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<sup>4</sup> For example, a press release by a coalition would describe the coalition and its issue.



available or is imperfect, issues might be seen to be important if others are seen as attracted to it. Issues that attract many ties from other actors in the policy domain might become a focal point because such ties serve to validate their importance and legitimacy (Berardo and Scholz 2005). An organization new to the policy domain might join with others in lobbying on issues that others are lobbying on because it reduces the new organization's uncertainty about which items on the agenda are important. *Hypothesis 3 states that an organization is more likely to lobby on an issue as the number of other organizations lobbying on that issue increase.*

Homophily, a process of attachments based on social similarity (MacPherson and Smith-Lovin 1987), might also facilitate influenced-based ties. Organizations that focus on a similar set of issues might encourage joint activity. By similar set of issues I mean not a common interest across the group of actors but an overlap among the bundle of issues on which each organization is active. If a lobbying organization has a number of common issues with another actor, their ongoing relationships are likely to be stronger. Moreover, actors with similar organizational attributes should share similar concerns. Thus, similar organizations should lobby on the same issue or same set of issues. *Hypothesis 4 is that similar organizations are more likely than dissimilar organizations to influence each other on the issues on which to lobby.*

### **The Retirement Policy Domain**

The research site for this project is federal retirement policy over the time period of 1998 through 2004. Lobbying in this area covers issues related to Social Security, federal pensions, private sector pensions, and related employee benefits topics. Much of the activity relates to tax and labor laws that govern the private sector retirement plans. Pension assets in private pension plans have seen tremendous growth since 1985 when total assets equaled \$2.2 trillion (in 2004 dollars), but that rose to \$5.7 trillion by 2006 (U.S. Department of Labor 2008). The diffuse and changing nature of retirement policy has opened the domain to a variety of groups. From 1998 through 2004, 392 Washington, D.C.-located organizations filed lobbyist registration reports with the Congress at least once, either on their own behalf or on behalf of other organizations; however, during any one period, the figure is much lower, ranging from a low of

97 organizations to a high of 198 in the first half of 2004. Figure 1 illustrates the frequencies of the number of lobbying organizations, for-hire lobbying organizations, clients, lobbyist disclosure filings, and issues listed in the disclosure reports for each period. The number of actors and filings shows a general increase over time, but the number of actors increases dramatically over 2003–2004, which is the period of focus for this paper. The frequency of issues shows a variability that is somewhat patterned as issues rise within each Congress.

[Figure 1 about here]

Figure 2 indicates patterns of time spent in retirement policy by breaking this out across 1998–2004 and illustrating the *churning aspect* of policy domains that have great movement around a core of actors. Organizations that lobbied in all 7 years are at the top of the figure and organizations that lobbied only 1 year are at the bottom. For example, in 1998 long-term lobbying organizations (those fifty organizations that were present in all 7 years) made up approximately 40 percent of the population while organizations that only lobbied in 1998 made up 17 percent of the population. Over time, long-term players make up a smaller share of the community with short-term players becoming more numerous.

[Figure 2 about here]

The implication of Figures 1 and 2 is that short-term players moved into the retirement policy domain in greater numbers, crowding the policy environment. Why did this influx occur? Among other reasons, the recession of 2001 put great pressure on employers to fund their pension plans; Congress passed major tax legislation in 2001 and 2003; and a Republican Congress and White House were receptive to employer and financial interests.

### **Data and Methods**

Overview: I rely on attributional and social network data of lobbying organizations in a single policy domain over time. I use different methods because my questions are somewhat different. For hypotheses 1 and 2, I examine the number of times an organization is selected for testimony or news media mentions and so I use a regression method suited for count data. For hypotheses 3 and 4, I look at how lobbying organizations select legislative bills on which to lobby. This is a bipartite network of lobbying

organizations and proposed legislation in which the lobbyists are ‘tied’ to the bills they are lobbying on. The longitudinal network model looks at how lobbying organizations change or maintain these ties over time while controlling for the overall network structure.

Data and Population of Interest – The population of interest in this project is the set of all organizations that are present in Washington, D.C. and that lobby in the retirement policy domain. The population of lobbyists is derived largely from publicly available disclosure reports that were filed by lobbying organizations on a biannual basis with the U.S. Congress over a seven-year period (1998-2004) for a total of 14 time periods.<sup>5</sup> I collected reports only for registered lobbyists such that the study excludes organizations that are represented by registered lobbyists (and do not have lobbyists themselves) or that are not required to register.<sup>6</sup> These reports indicate issues or bills on which organizations lobbied, policy domains in which the organization is active, and basic organizational information amount of expenses related to lobbying (or income from lobbying in the case of for-hire lobbying organizations), the number of staff, and the total number of policy domains in which the organization lobbies.

In order to make the data manageable and accessible, I only include lobbying organizations with a headquarters or office in the greater Washington, D.C., area. A further limitation is that the organization must have indicated on their disclosure form that they lobbied on retirement policy. Therefore, from 1998 through 2004, as noted above, 392 organizations filed lobbying disclosure reports for the retirement policy domain, either on their own behalf or on behalf of other organizations. However, during any one period of time the figure is much lower. The number of actors in any time period is smaller beginning with just under a hundred in the first half of 1998 to nearly 190 by the end of 2004.

Variables for Regression Analysis – As noted above, there are two dependent variables for the standard regression analysis, one for congressional testimony and the other for news media mentions.

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<sup>5</sup> Lobbying for registration purposes is relatively narrow as it only includes informal contacts between lobbyists and policy makers (Furlong 1998). Also, because of expenditure minimums, groups relying on volunteers, those active only for a short time, or those active on a single issue may not be required to register (Baumgartner and Leech 2000). Preliminary interviews in each issue area will help identify potentially missing organizations and coalitions.

<sup>6</sup> The website for the federal lobbyist registration reports is <http://sopr.senate.gov/>.

*Congressional Testimony:* The first dependent variable measures the number of times that an organization testifies before a congressional committee of jurisdiction during a six-month time period. Members of Congress believe that committee hearings are an important vehicle for efficiently gathering information and for exerting influence over pending issues (Kingdon 1981). The final shape of a bill is often affected by conflicts among witnesses about how issues should be framed (Baumgartner and Jones 1993), and simply holding a hearing broadcasts the judgment of the committee that the issue under discussion is important (Diermeier and Feddersen 2000). And why should lobbying organizations participate in hearings? Hearings are often scripted affairs in which questions and sometimes answers are crafted in advance. In some cases hearings might be thought of as propaganda channels. However, the fact that organizations with private information usually testify is crucial. Legislators considering whether to support a bill may find testimony from experts informative (Burstein and Hirsh 2007), and experts may care about establishing a reputation for correctly predicting policy outcomes (Diermeier and Feddersen 2000). Testimony may be the first time that an organization's private information or claims on an issue become public and so may be especially influential (Baumgartner and Leech 1998). In short, the lobbyists themselves see committee testimony as a measure of influence (Laumann and Knoke 1987).

In the interest group and policymaking literature, linking interest group preferences to committee preferences has been done in the case of congressional testimony (Baumgartner and Jones 1993; Jenkins-Smith, St. Clair, and Woods 1991). These studies conclude that hearing testimony tends to target sympathetic lawmakers. Lobbyists tend to specialize and interact with similar types of people, be they lobbyists, legislators, congressional staff, or administration officials (Leyden 1994). Theoretical work on interest groups often begin with the assumption that members of Congress seek to promote their conceptions of good policy, to be reelected, and to gain the recognition of their legislative peers (Fenno 1973). In order to promote these goals, members seek information of three types: agenda information about the importance of problems they are asked to address (Kingdon 1981; Baumgartner and Leech 1998); political information on the electoral consequences of their decisions (Amenta, Carruthers, and Zylan 1992) and policy information regarding the consequences of a policy change (Arnold 1990; Hansen

1991). Thus, interest groups likely influence legislators through the information that they provide, and the concept of information is a broad one that encompasses not only facts but the context that gives meaning to those facts, including causal arguments or claims (Burstein and Hirsh 2007).

In the retirement policy domain, there are four committees that have broad jurisdiction over retirement policy issues. In the House of Representatives, the committees are the Ways and Means Committee and the Education and the Labor Force Committee, and in the Senate there are the Finance and Health, Education, Labor, and Pensions Committees. I looked at every full committee or subcommittee hearing on a retirement-related issue over 1998 through 2004 and collected data for each instance that one of the organizations included in this study testified before a committee. These counts were aggregated into six month time periods in order to correspond with the six month reporting periods for lobbyist disclosure filings. From 1998 through 2004, the four committees of jurisdiction held 64 hearings related to retirement policy. The lobbying organizations used in this study made a total of 119 hearing appearances over this time.

*News Media Stories:* The interest group literature often makes a distinction between inside and outside strategies, with inside strategies being those actions that target government insiders such as personal lobbying and outside strategies focused on outside actors such as the general public (Baumgartner and Leech 1998). Working with the news media has been considered, however, both an insider and an outsider tactic (Gais and Walker 1991). Lobbyists are a frequent source of comment on policy proposals for journalists because they often are conveniently located near the halls of power and they are attuned to what the press needs and wants (Berry 1977). Usually, lobbying organizations have spokespersons who are articulate and have some expertise on an issue.

Speaking with journalists is a fairly common tactic among lobbyists: Studies have found that between 72 percent and 86 percent of lobbyists who were surveyed report using the mass media (Schlozman and

Tierney 1986; Walker 1991; Nownes and Freeman 1999).<sup>7</sup> Kollman (1998) notes that press statements by lobbying organizations are an important tactic, but that the targets of press statements are not necessarily the general public: “It seems that group leaders tend to use press conferences to explain technical material to the press or to communicate to people within the policymaking community” (1998: 95-6). When asked about media publicity campaigns, 51 percent of interest groups in the Kollman (1998) study responded that their primary targets were the president or Congress as opposed to the public.

How do lobbying organizations get quoted in the national press? There has not been much work on this topic. What research exists suggests that an organization's media strategy matters, but that organizational structure and organizational identity color these strategies (Rohlinger 2002).

I used the Lexis-Nexis database to search mentions of lobbying organizations in the major U.S. newspaper and wire service sub-database in connection with some aspect of pensions or retirement. I checked the news stories to filter out irrelevant news stories (e.g., obituaries in which the deceased's affiliation with an organization was mentioned). I made, however, an important distinction in collecting news data relative to congressional committee hearing data. For the news media variable, I only used those organizations that were membership-based such as trade associations, professional associations, broad-based public interest groups, and labor unions. The reason for narrowing the sample is that a corporation will make the news for a variety of reasons completely unrelated to its activities on policy. In contrast, membership organizations are inherently representative of some group and are likely to be quoted or mentioned for that reason. By narrowing the category of organizations in this way, the sample was reduced from 392 to 120 with 835 total observations over time. The 120 lobbying organizations were mentioned in news media stories 4,323 times over the seven year timeframe. While this may seem like a large number, a number of mentions were repeats in the sense that a story would be picked up by a number of media outlets.

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<sup>7</sup> But see Knoke (1990) who reports only 15 percent of lobbyists surveyed report using the mass media. Baumgartner and Leech (1998) suggest that the low percentage may be due to the large number of apolitical groups in the Knoke sample.

*Social network positions* – An organization’s position in the policy network is the critical concept that is woven throughout this paper. Social networks show two things that are relevant to analyzing the hypotheses discussed above. First, by analyzing an organization’s position relative to its peers, we can understand that organization’s access to resources and its visibility and credibility among its peers as complementary to its own organizational attributes. Second, an understanding of the broad pattern of inter-organizational ties or relations enables an understanding of the policy domain; the overall nature of embedded relations and their sources and consequences.

To construct the network data and the social network variables,<sup>8</sup> I collected data from the federal lobbyist registration reports for each of the 14 six-month time periods (from January-June 1998 through July-December 2004). The data was entered into matrices in which the rows represent lobbying organizations and the columns represent different legislative bills or issues. These organization-by-issue matrices were transformed into organization-by-organization affiliation matrices based on common issues that serve as ties between organizations. This transformation occurs when the original organization-by-issue matrix,  $A$ , is multiplied by its transpose,  $A'$ . Fourteen affiliation matrices were thus created, and within each matrix a set of social network measures and non-network measures were created, which are more fully discussed below.

Another set of variables come from a directed network of association membership that is not longitudinal in nature and a longitudinal network of for-hire relations. The association network was created by looking up membership lists of the associations that had lobbying organizations as members. While most organizations had longitudinal data on their membership, some did not so I only used the most recent membership data. Most data was collected for the year 2004, the last year of this study but in a few instances data came from 2005 or 2006 sources. For relationships based on hiring lobbying firms (referred to here as ‘for-hire firms’), information was obtained from the lobbyist disclosure reports for 1998 through 2004. The for-hire relationships are very sparse, particularly in the early years of the study. I merged the association-level and for-hire level networks in order to get a comprehensive map of which

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<sup>8</sup> For social network measures, I use the social networks software program UCINET (Borgatti et al. 2002).

organizations are paying others for membership or representation services – I refer to this as the “resource network”. In total, there are two network levels, one at the level of issue-based relations and another at the level of flows of resources.

*Coalitions:* Hypothesis 2 is focused on the effects of coalition membership. I collected data on coalitions that were visible and had an identifiable membership. This data was created by researching various websites related to retirement policy and finding information produced by coalitions devoted to retirement policy.<sup>9</sup> I used qualitative information from interviews with individual lobbyists as well as from internet archives (www.archive.org) for this search and was able to identify 31 coalitions from 1998 through 2004 for which membership information was available. The coalition variable focuses on an organization’s participation in group activity. For this study, coalitions are inclusive of many types of joint activity, for example, from signing one’s name to a group letter all the way to a formally structured coalition with a budget and steering committee. The variable for coalitions is a continuous variable counting the number of coalitions in which an organization is a member over a particular period of time. I focus on the number of coalitions rather than a dummy variable for any participation in order to capture the level of coalition activity.

*Controls:* I control for group interest like professionals, financial services, labor, and private employers, with public interest groups being the reference category. I also include variables for organizational resources (number of staff and amount of expense or income averaged on a per policy domain basis), activity (in terms of total policy domains in which an organization is active), and longevity (a dummy variable indicating a long-term presence – six or more years in the retirement policy domain).<sup>10</sup> I also add two period-specific variables in order to capture exogenous events. Because retirement plan

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<sup>9</sup> For example, a press release by a coalition would describe the coalition, its issue, and membership.

<sup>10</sup> The analyses drops three variables due to collinearity: Dummies for being a membership organization or for being a self-representing organization and a variable for the amount of time spent in the retirement policy domain in terms of six-month increments.



funding is sensitive to the larger economy, which then affects the legislative interest in retirement policy, there is a dummy for the 2001-2002 period in which George W. Bush was president and during which the country was in recession (Bush recession) as well as the post-recession period of 2003-2004 (Bush recovery) – The Clinton years of 1998-2000 are the reference period.

Regression Model for Count Data: For hypotheses 1 and 2, a negative binomial regression methodology is used. The two dependent variables that proxy for influence, one for testifying at a congressional hearing and the other for mentions in the news media, are count variables whose means are much less than their variances. As I have exact dates for both hearing appearances and mentions in the news media, I can more fully exploit the longitudinal nature of the data using a multilevel method, which controls for multiple observations for an organization over time. I divide the independent variables into four models. There is a baseline model, which includes only the control variables. The Network model adds the social network measures. In the Coalition Model, I add a variable for coalition participation. The Full Model incorporates the control variables, the social network variables, and the coalition variable.

These dependent variables are over-dispersed, longitudinal count data. Approaches based on the Poisson distribution are appropriate for analyzing count data, but because the variance for both the hearing (1.29) and news media (91.38) variables exceed their means (0.35 and 35.84 respectively), the negative binomial regression model is favored. The longitudinal format of the data further complicates the methodology by violating the assumption of independence in conventional models (Long 1997). Problems of autocorrelation and heteroskedasticity result, producing spuriously low standard error estimates. However, random effects models for cross-sectional time series data have been developed to account for the non-independence of events. I use a random effects design rather than a fixed effects because those organizations with “0” outcomes – organizations that do not testify and/or do not get mentioned in the news media – are dropped from the fixed effects analyses, resulting in substantial

attrition. The models are estimated using the ‘xtnbreg’ function in STATA 10 with standard error estimates adjusted for clustering within organizations in terms of multiple observations over time.<sup>11</sup>

Longitudinal Network Modeling: I am also interested in how issue-based networks change. As noted above, policy domains are dynamic in nature with organizations entering and leaving in every period. During this flux, relationships form, deepen, and dissolve with implications for the overall structure of relations (Heaney and Rojas 2004; Powell, Kogut, White, Owen-Smith 2005). “Choices made early may strongly affect subsequent opportunities, but path dependence can be offset by a constant flow of new arrivals and departures” (Powell et al. 2005: 1136).

*Lobbyist-Bills Bipartite Networks:* The networks used in this portion of the analysis are bipartite or two-mode networks consisting of lobbying organizations and legislative bills. Using the data described above, I used the issues and bills identified by the lobbying organizations in their disclosure reports to create matrices with rows of lobbying organizations and columns of legislative bills. When an organization indicates that it is lobbying on a particular bill, a tie goes from the organization to the bill. Figure 3 illustrates these relations below with the bipartite network for the second half of 2000 with blue squares representing bills and red circles representing lobbying organizations, and a line going from an organization to a bill meaning that the organization has listed that bill on its lobbyist disclosure form. One can see that the majority of lobbying organizations are connected to each other via the bills on which they are lobbying and that there is a core of activity in the center of the network with a cluster of bills and organizations receiving and giving ties (the line arrows).

[Figure 3 about here]

The dependent variable is the set of changes in the networks over time. Because working with large networks uses a lot of computational effort, for this analysis I only use 4 networks for the 106<sup>th</sup> Congress (1999-2000): the first and second halves of 1999 and the first and second halves of 2000. In this time

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<sup>11</sup> I also conducted a logistic regression analysis by recoding the dependent variables as binary. For example, rather than the number of times that an organization testified before Congress within a six-month period, the dependent measure was coded as “1” if the group testified one or more times during the same time period and “0” if not at all. The results of the logistic regressions were similar to the main effects reported here and are therefore not presented.

period there were 190 lobbying organizations and 311 legislative bills.

*Network parameters:* I use a variety of explanatory covariates in explaining how the network changes over time. The key network parameters for hypotheses 3 and 4 are popularity (in-degrees) effect of a bill and the 4-cycle effect, respectively. The popularity or in-degree effect is simply the number of incoming ties from lobbying organizations to bills. If a bill has a lot of ties coming from lobbying organizations, its popularity or in-degree measure will be high, and an organization will select bills on the basis of their popularity. The 4-cycle effect looks at similar choices between organizations. If organization A is lobbying on bills X and Y and if organization B is lobbying on X, the 4-cycle effect predicts that organization B will then select bill Y for lobbying. Figures 4a and 4b illustrate these two effects with the dotted line representing the choice of the lobbying organization.

[Figures 4a and 4b about here]

The analysis controls for effects related to the lobbying organizations and the bills. For organizations, I include their betweenness centrality and their constraint in their multiplex network, which is the combined membership association and hiring networks (these are combined here for computational purposes but are separate in the regression analysis above). I also include measures for the number of coalitions in which the organizations participate, the number of hearings to which they are invited, and the average agenda overlap for each organization during the 1999-2000 time period.

For legislative bills, I control for the number of cosponsors for that bill, a dummy variable indicating whether the bill sponsor is the member of the committee of jurisdiction for that bill, and the bill's ultimate progress (an categorical measure for not reported out of committee (1), reported out of committee (2), approved by one chamber (3), reported out of the committee of jurisdiction in the second chamber (4), approved by the second chamber (5), and passage into law (6)).

*Statistical Model of Network Change:* To model the longitudinal coalition network data, I used the *actor-oriented* statistical network model as expressed in the software program SIENA (Snijders, 1995,

2001, 2005; Snijders & Van Duijn, 1997).<sup>12</sup> The model evaluates the changes in the lobbyist-legislation networks because of the rational actions of the lobbying organizations. In this model, each actor maximizes a utility function built on substantive arguments and constructed such that the function represents the costs and rewards for an actor to be in a specific state (e.g., selecting, dropping, staying away from, or staying with proposed legislation) at one moment in time. In general, the choice of action for actor at time  $t$  is based on the independent variables. If an action can be described as a function of one or more substantive utility arguments, the model assumes that the actor is able to determine the expected effects of future actions. Therefore, each decision is associated with a change in utility. The choice of action can also be founded on utility arguments that are not explicitly modeled in the utility function and measurement or specification errors exist; therefore, the model assumes that the actor would choose the action that would maximize utility combined with a random error term. When the expected change in utility is approximately the same for all actions the actor's choice will be more or less entirely determined by pure chance. However, if (compared to other actions) one action is associated with a relatively large increase of expected utility, the probability that the actor will choose this specific action is also relatively large.

In summary, I observed the networks of lobbying organizations at different points in time and collected information regarding a number of fixed and varying individual attributes. However, the model simulates what happens between the points of observation using the random utility model. The organizational actions that make the network develop are the core of the simulation procedure.

SIENA estimates the model based on a maximum likelihood estimator using the method of moments, implemented as a continuous-time Markov Chain Monte Carlo simulation. The model (a) calculates likely starting values for the parameters, (b) simulates the choice process according to the starting values, (c) compares the resultant simulated network with the observed networks of actual coalitions, and (d) adjusts values to reduce differences between the observed and the simulated data. The model then uses a number

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<sup>12</sup> I used version 4.0 of SIENA for use in R (Snijders, Steglich, Schweinberger, and Huisman 2007). A free copy of the latest version is available at <http://stat.gamma.rug.nl/siena.html>.

of simulations to determine the frequency distribution of predictions, which then are used to calculate standard errors for the final parameter values.

## **Results and Discussion**

Before proceeding to the regression analysis, I first map the relationship between an organization's time spent in the policy domain and the number of hearing and news media appearances in Figures 5 and 6. In both cases, there is a clear upward slope in the distribution of the scatter plot. This implicit slope is confirmed by the correlation of time spent in the retirement policy domain and each measure: The number of appearances at congressional hearings is positively correlated with time spent in retirement policy at 0.36, and the correlation for news media stories is 0.33. If lobbying organizations need to cultivate ties to congressional committees and journalists, time and history matter in the process. Those organizations that focus on retirement policy have likely developed an expertise that is useful for the informational goals of a hearing, but there may also be a trust factor in that long-term organizations are well-known and dependable.

[Figures 5 and 6 about here]

Congressional Hearing Testimony - Table 1 provides the results for congressional committee hearing appearances with four models. In terms of the baseline model, there are two statistically significant associations. As suggested in Figures 5 and 6, organizations that have a long-term presence in retirement policy see the level of participation in congressional committee hearings increase by a factor of 5 ( $\text{exponent}(1.608) = 4.99$ ), which is a very strong effect. The other significant variable in the Baseline Model is the Bush recovery period (2003 through 2004). Relative to the 1998 through 2002 time period, lobbying organizations were much less likely to testify in front of Congress during the 2003-2004 period, perhaps reflecting the economic pressures on pensions during the 2001-2003 recession were driving the focus of hearings and hence the witness list.

The Network Model adds the four social network measures for issue centrality, agenda overlap, membership centrality, and membership constraint. None of these network variables are significant while the variables for long-term retirement policy presence and the Bush recovery variables retain their effects

from the Baseline Model. In addition, the staff variable indicates a positive and mildly significant effect (at the 0.10 level). Thus, controlling for network position and other factors, there is some indication that having more resources in terms of staff may help an organization secure a spot as a witness at a congressional hearing.

The Coalition Model adds a variable for the number of coalitions in which an organization participates, and the result is a positive and strongly significant association with hearing appearances. Each additional number of coalitions an organization participates in is associated with a 29 percent increase ( $\text{exponent}(0.251) = 1.285$ ) in the level of appearances before congressional committees. Thus, joint activity may heighten visibility and attractiveness for congressional committees. However, the addition of the coalitions variable results in the long-term variable losing both the strength and significance of its effect, which reflects the relationship between long-term participation in policy and the level of participation in coalitions. In addition, an organization that is or represents a private employer shows a weakly negative relationship with hearing appearances. Membership in multiple coalitions may be bringing out a negative effect in being a private employer.

The Full Model confirms the main effects discussed above. The more coalitions in which an organization participates, the more it will be involved in congressional committee hearings. The effect of coalitional participation is also shown by the model fit statistic of Log Likelihood. The model fit is significantly improved in the two models in which the coalition is included. These effects confirm our hypothesis 2 for congressional hearings. As I discussed above, prominence within a coalition or across coalitions (which the number of coalitions in which a group participates acts as a proxy) may signify an organization's expertise on an issue as well as the gravity of the issue itself. Although the other hypotheses were not confirmed, these results show, in addition to organizational resources such as the number of staff working on retirement policy issues, the importance of joint activity and the social relations that underpin that activity.

In terms of congressional hearing appearances, hypothesis 1 is not confirmed as the social network measures showed no significant effects, but hypothesis 2 does appear to be confirmed. Coalition

participation clearly trumps network position, and this may occur in this context for a couple of reasons. First, because congressional committees have (somewhat) clear boundaries in terms of jurisdiction over policy issues, those organizations with a long history of working on those issues may have a clear advantage in being invited to testify over organizations that just dabble in a policy domain. Second, because congressional staffers running hearings typically have more requests to testify than actual slots, inviting those organizations that are part of broad coalitions may be easier to justify both to committee members and to disappointed applicants. Third, a latent effect may also be significant. As mentioned above, relationships with congressional staffers may matter a great deal more in terms of getting an invitation to testify than inter-organizational relations in a policy field, but I do not have a direct measure for the congressional staffer relationship.

[Table 1 about here]

News Media Appearances - We see similar results for news media analysis, which is presented in Table 2, and for that reason I will not present a model-by-model description. As in the prior table, being a long-term player in retirement policy boosts the level of news media visibility, but this effect dissipates into insignificance when the coalition variable is added to the mix. The coalition variable is strongly significant at the  $p < 0.01$  level. We also see a consistently negative, strong, and significant effect of representing a private employer.<sup>13</sup>

A striking difference from the results for congressional testimony in Table 1 is the effect of private employers' interests. Relative to other types of interests, groups and trade associations that represent private employers are not likely to be receive as much media attention and this effect is strengthened when the coalition variable is added to the model as was the case with congressional hearings.

We do see some significant effects for two network variables. Membership-level constraint is negatively and robustly associated with media attention although its statistical significance is weak at the 0.10 level. Thus, being more constrained by redundant ties to others in the network of trade association

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<sup>13</sup> Recall that in this portion of the analysis, I am only looking at organizations that represent other organizations on a membership basis. Thus, private employers are excluded.

and for-hire relationships is likely to dampen an organization's ability to attain media visibility. This makes sense in that redundant ties probably indicate a lack of distinguishing characteristics or limited information that would be of use to the news media. In addition, higher centrality at the membership level boosts, albeit weakly, an organization's visibility in the news media. In general, an organization that can belong to other organizations in a way that makes it the center of relationships with diverse ties to other membership organizations is likely to receive more mentions in national news media coverage. Journalists may sense through repeated interaction that organizations with such central network positions are able to provide more insights on policy questions.

In terms of our hypotheses, then, we see some weak support for hypothesis 1, which argued that superior network position boosts influence in the form of news media visibility. However, we see consistent and strong support for hypothesis 2, which stated that greater participation in coalitions would be associated with greater influence although this effect is not as strong as was the case with congressional committee testimony.

[Table 2 about here]

Dynamic Modeling of Lobbyist-Bill Networks: Table 3 describes the changes in the lobbyist-bill network over the observed time periods. Looking at the first column of results (No Bill (0=>0)), the vast majority of observations are for non-ties, that is, when a lobbying organization has not chosen a bill for lobbying. The second column labeled New Bill indicates newly created ties when an organization selections a bill, and this indicates an organization selecting a bill for lobbying. The third column, Drop Bill, gives the number of times an organization drops a bill for lobbying. The fourth column, Keep Bill, indicates when an organization keeps lobbying on a bill from one time period to the next. In summary, there is a fair amount of change in terms of the lobbying organizations' selections of legislative bills. The next table models these changes in the broad network of lobbyists and bills over the four time periods.

[Table 3 about here]

Table 4 provides the results of the longitudinal modeling of the lobbyist-bills network over the four time periods in question. The first three rows of results are the rate parameters that provide the estimated



changes per organization from one period to the next. The next row of results is the Outdegree (density) parameter that, according the SIENA literature is not interpretable and serves as a control for the network density. The rest of the parameters are the effects of interest for this paper.

The in-degree parameter evaluates the effect of a bill's popularity on the choices of lobbying organizations to select it. We can see that this has a strong and significant effect (0.4033) such that we can that the more times that a bill is selected for lobbying, the more likely it will attract additional ties. The other key network effect is the 4-cycles in which similar organizations make similar choices. There is a small yet significant effect for 4-cycles as choices made by others will affect the choices of a particular lobbying organization.

As for the control variables relating to the bills, bill progress (0.0944) shows a modestly positive and significant effect. Lobbying organizations not surprisingly are picking winners and jumping aboard the trains that are leaving the station. The number of cosponsors on a bill (0.0026) and whether bill's sponsor is a member of the relevant committee of jurisdiction (0.2419) are also significant and positive. In terms of organizational controls, the number of coalitions to which an organization belongs is significantly negative (-0.2739). Belonging to a number of coalitions appears to limit the choices of organizations, which may make sense as coalitions may focus efforts and resources after deliberation by coalition members. This finding seems to relate back to hypothesis 2 as well. Total time in the retirement policy domain increases the number of ties (0.2537) as does being selected to testify at congressional hearings (0.5579). Being a long-term player in the policy as well as being more influential may indicate a greater reach across issues as bills are introduced over the span of a Congress. The average agenda overlap measure was not significant.

Overall, Table 4 indicates support for hypotheses 3 and 4 in that an organization is more likely to select a bill when others have selected that bill and organizations with similar choices will select the same bills. Thus, these results provide some support for the idea that social relationships influence choices in an interest group context.

[Table 4 about here]

**Conclusions** – The purpose of this paper was to move the discussion from the focus on the organizations and their relations with other groups to an analysis of the outcomes, if any, associated with such relationships. There are such outcomes, and they make sense. The major finding, which confirms hypothesis 2, is that joint activity in the form of participation in coalitions is likely to boost an organization’s influence as operationalized in the form of congressional committee appearances and news media visibility. This is a striking result given that the outcomes are distinctly different. Underlying network positions such as centrality, constraint, and agenda overlap show some significant connection to influence but are not as important as coalitional activity. Thus, hypothesis 1 is only weakly supported in the case of news media visibility and not at all in the case of congressional testimony.

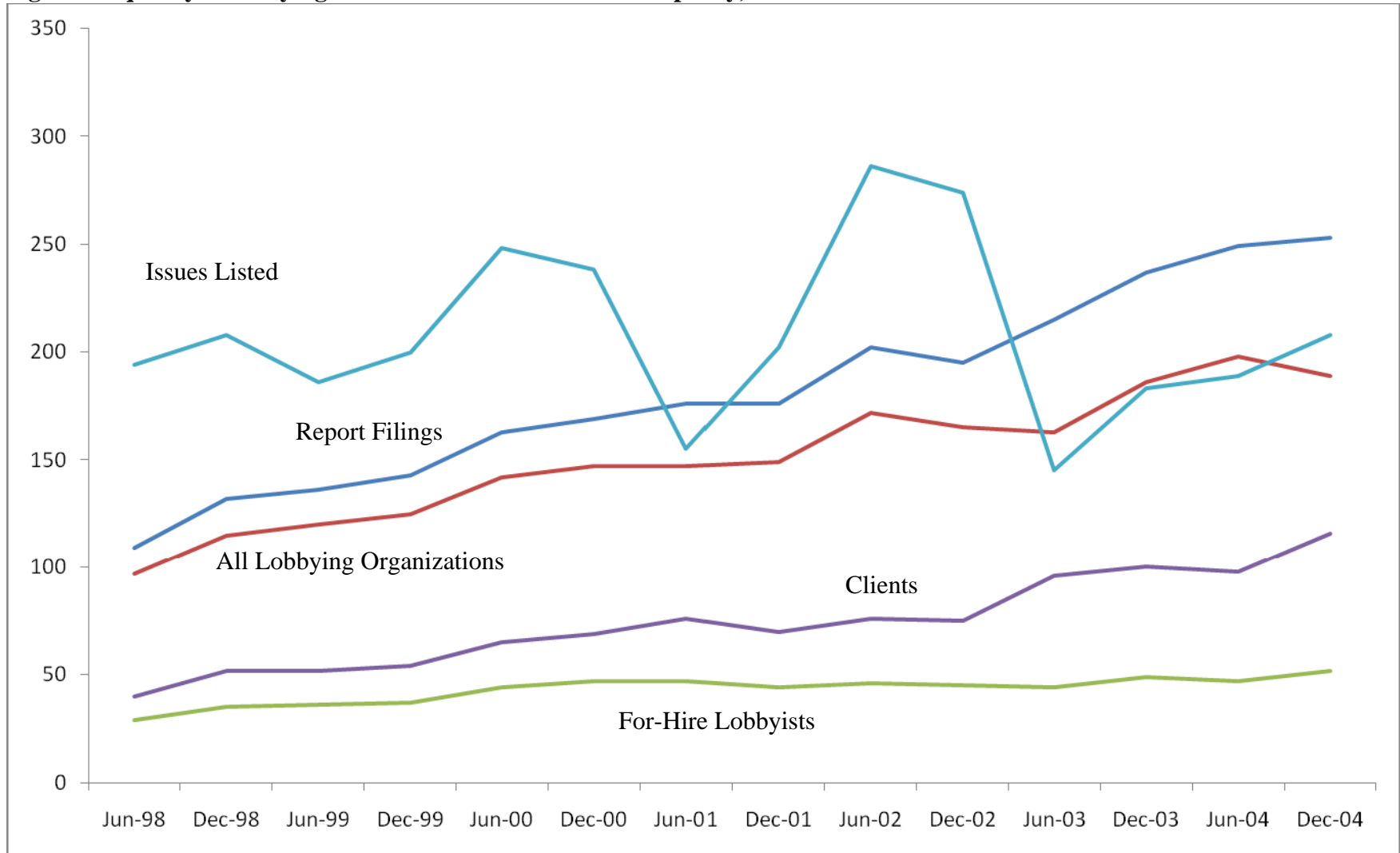
The longitudinal model of network change attempted to explain the agenda choices of lobbying organizations over four time periods, and the key argument here is that the choices will be influenced by the choices of other organizations in the policy domain. The results provided support for both hypotheses 3 and 4.

Unlike prior studies of influence, this paper has not tried to measure influence as an input, such as with campaign contributions. Rather influence is treated as an output, a reflection of position in the network of relationships. Status in the form of influence and network position reinforces each other as a continuous process. Those organizations with superior network position or that participate in more coalitions tend to get mentioned more in the news media. Others read those stories and seek out the representatives of those organizations, thereby contributing to their enhanced network position. As noted above, a “Mathew Effect” takes hold as a result: When discussing count variables, I have shown a huge variance with the dependent variables in this study, necessitating the use of negative binomial models because the “rich get richer.”

So we have some basis to conclude that social relations among lobbying organizations matter in terms of cooperation and influence. But how do they matter? What is it about these relations that lead to these outcomes and others not studied here? An extension of this project would engage the qualitative evidence of networked relations among lobbyists and policymakers. In this approach, interest group actors would

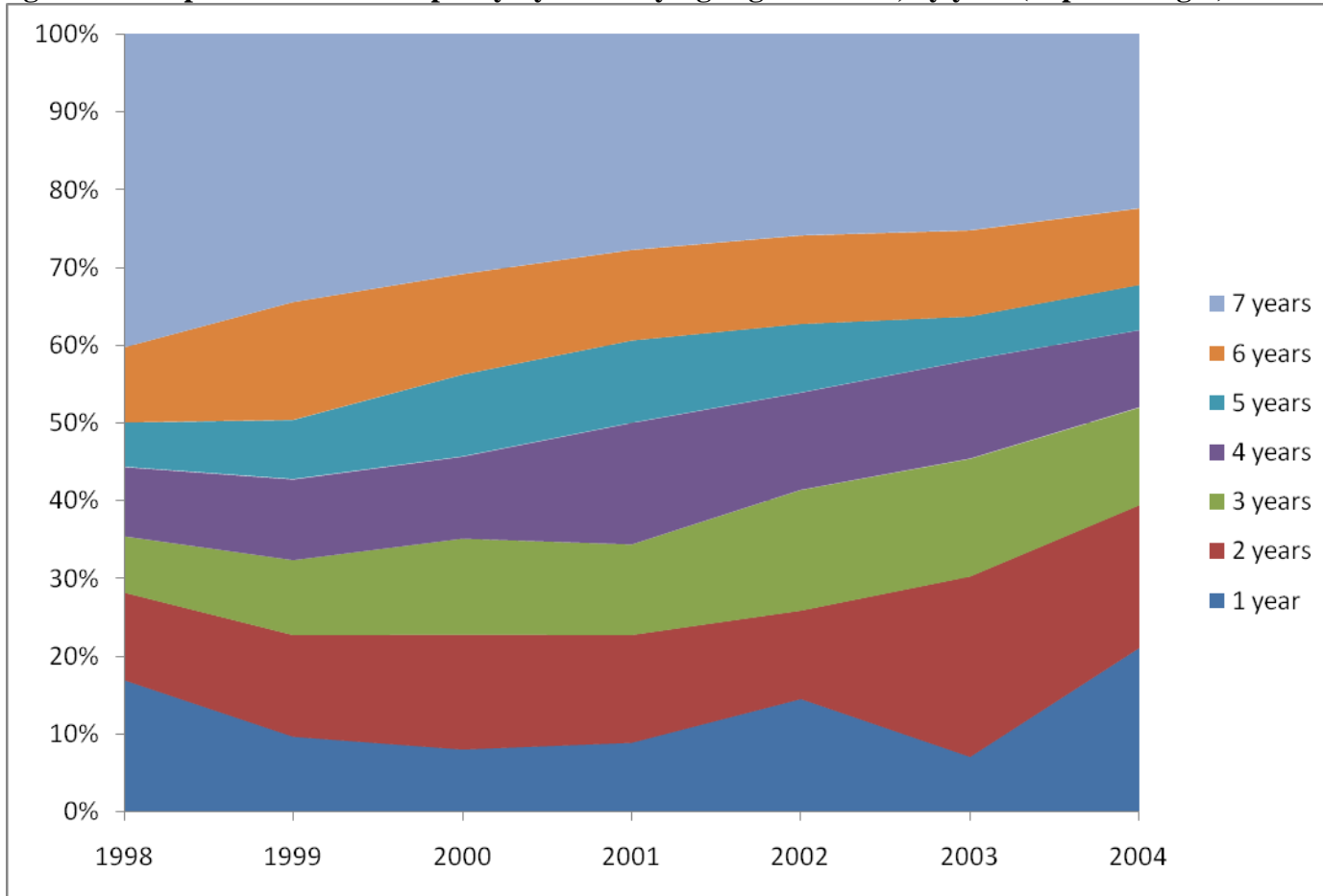
discuss what they think trust is and how it operates in policymaking. Not only would this discussion provide some ‘flesh on the bones’ of the structure we have examined so far, but it will also set up a discussion about the interaction between policy domain insiders and those on the outside trying to effect change.

**Fig. 1: Frequency of lobbying actors and issues in retirement policy, 1998–2004.**



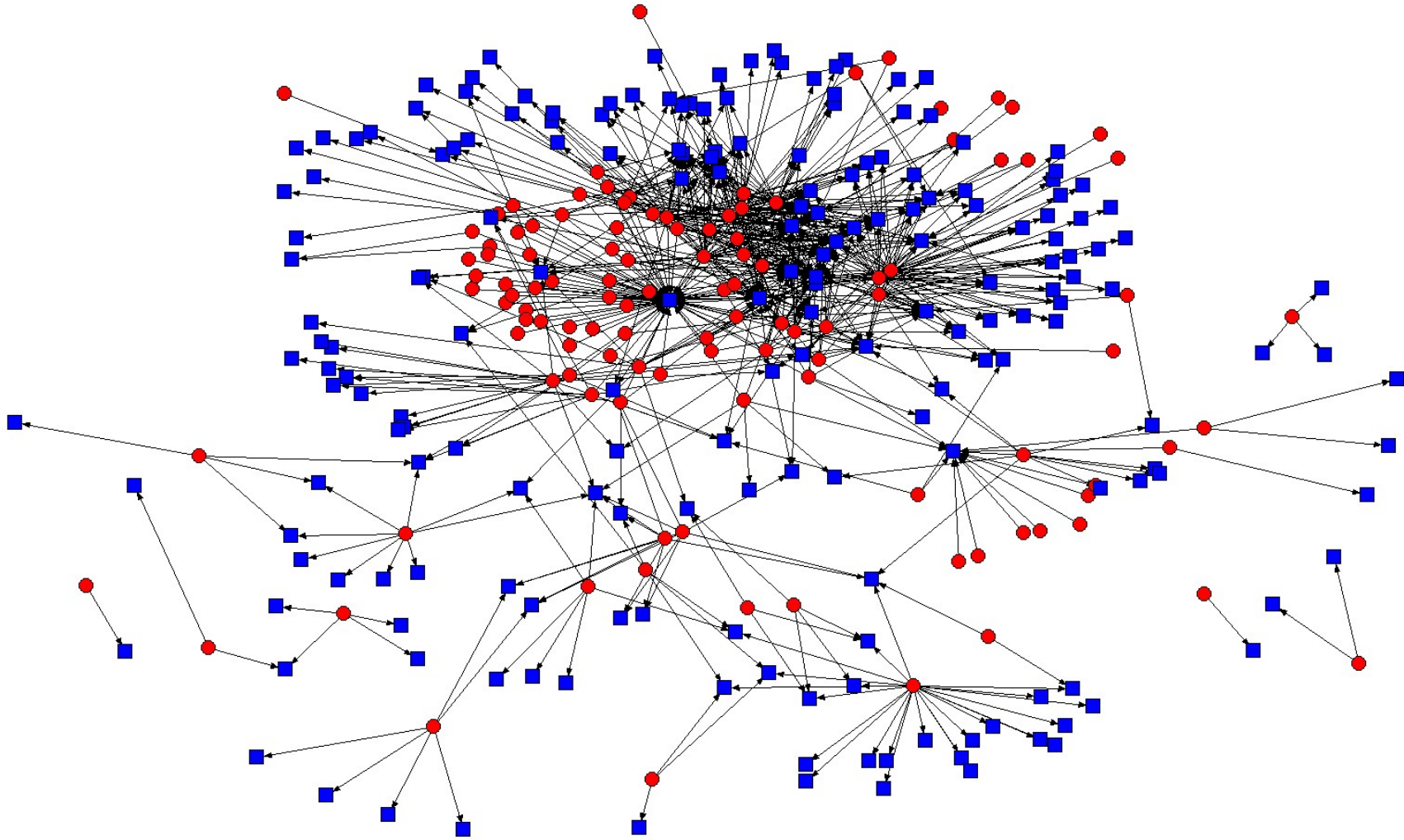
Source: Author's compilation of lobbyist registration reports and other publicly available data.

**Fig. 2: Years spent in retirement policy by all lobbying organizations, by year (in percentages).**



Source: Author's compilation of lobbyist registration reports and other publicly available data.

**Figure 3: Bipartite Network of the Retirement Policy Domain, Second Half of 2000**



Source: Author's compilation of lobbyist registration reports and other publicly available data.

**Figures 4a and 4b: Popularity/In-Degree and 4-Cycle Effects**

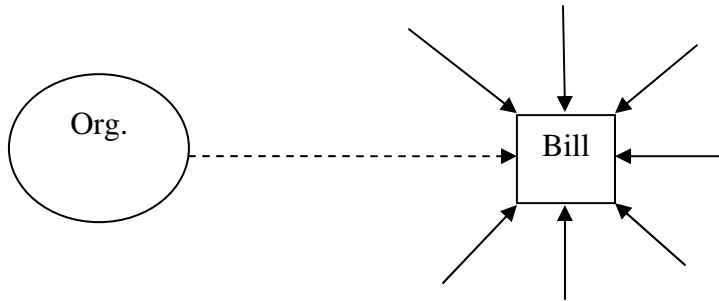


Figure 4a: Popularity or In-degree Effect

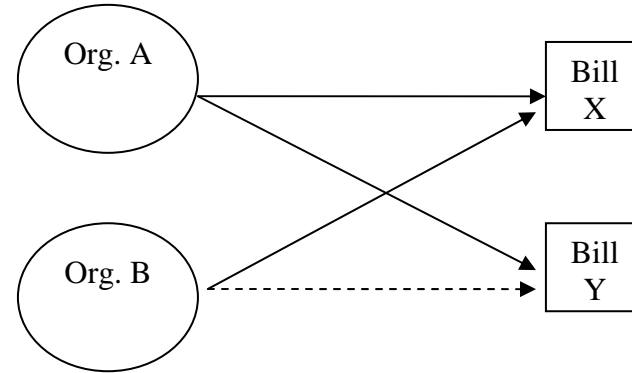
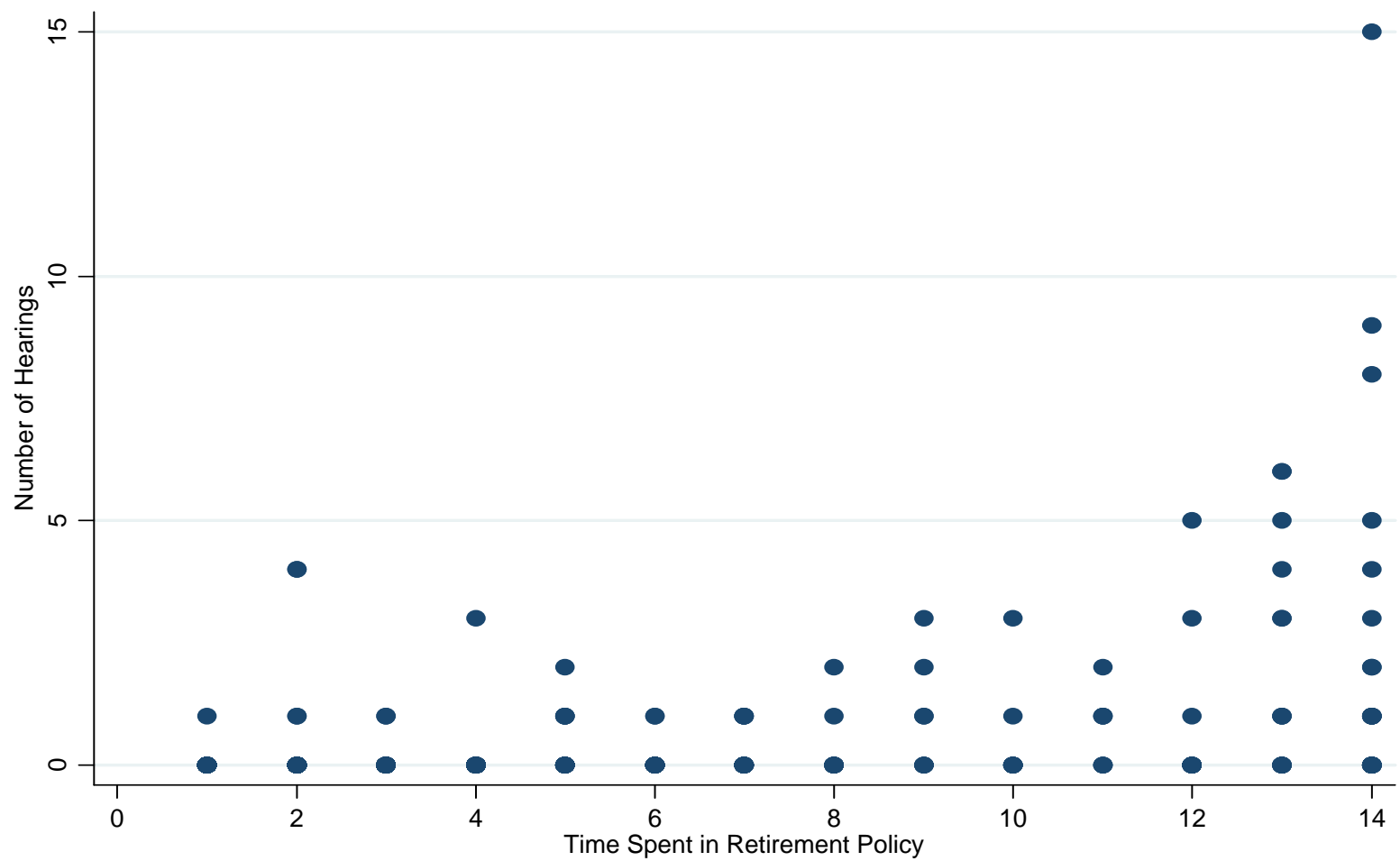


Figure 4b: 4-Cycle Effect

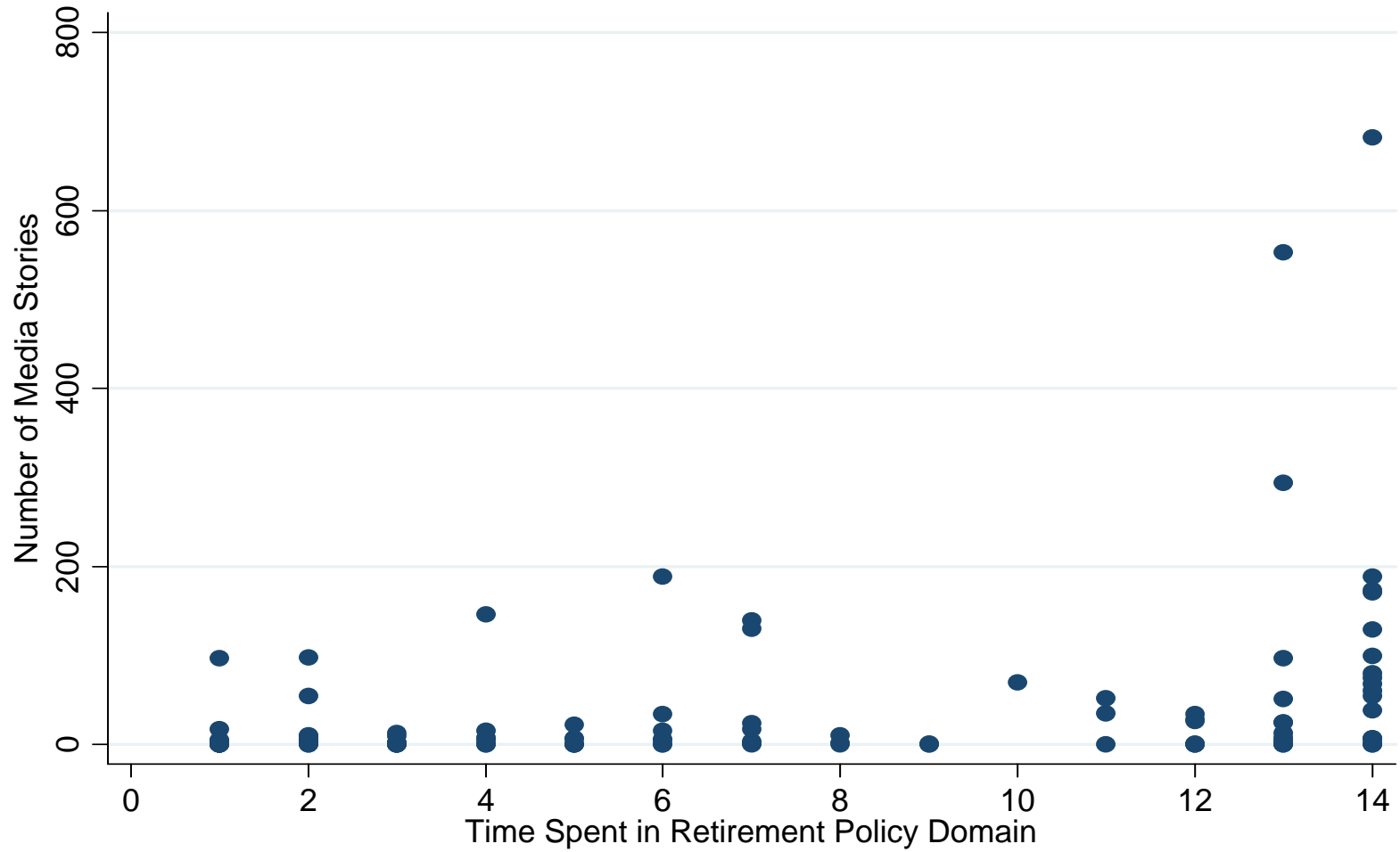
**Figure 5: Number of Hearings by Time Spent Lobbying in the Retirement Policy Domain**



Source: Author's compilation of lobbyist registration reports and other publicly available data.



**Figure 6: Number Times an Organization is Mentioned in News Stories in Major U.S. Newspapers and Wire Services**



Source: Author's compilation of lobbyist registration reports and other publicly available data.

**Table 1: Results of Negative Binomial Regression of Testimony at Congressional Hearings, 1998-2004 (n = 392).**

	Base	Network	Coalition	Full
Professionals	0.728 (0.760)	0.783 (0.710)	0.156 (0.600)	0.198 (0.560)
Financial Services	0.474 (0.640)	0.535 (0.640)	-0.130 (0.480)	-0.028 (0.490)
Labor	0.687 (0.720)	0.906 (0.720)	0.366 (0.530)	0.487 (0.560)
Private Employers	0.635 (0.590)	0.683 (0.590)	-0.930* (0.550)	-0.862 (0.560)
Expense/Domain	0.002 (0.006)	0.002 (0.007)	0.003 (0.006)	0.002 (0.006)
Staff	0.106 (0.067)	0.117* (0.068)	0.096* (0.051)	0.108** (0.051)
Policy Domains	-0.013 (0.026)	-0.013 (0.026)	-0.022 (0.023)	-0.019 (0.024)
Long-Term	1.608*** (0.390)	1.569*** (0.380)	0.449 (0.370)	0.448 (0.370)
Bush Recession	0.049 (0.220)	-0.006 (0.220)	0.060 (0.220)	0.062 (0.230)
Bush Recovery	-0.613** (0.270)	-0.671** (0.300)	-0.589** (0.270)	-0.531* (0.290)
Issue Centrality		-0.345 (0.390)		-0.498 (0.430)
Agenda Overlap		-1.792 (1.550)		-2.059 (1.540)
Membership Constraint		-0.549 (0.350)		-0.289 (0.330)
Membership Centrality		0.005 (0.004)		0.002 (0.004)
Coalitions			0.251*** (0.046)	0.255*** (0.048)
Constant	-0.199 (2.510)	9.642 (400.000)	0.451 (190)	11.620 (464.000)
Log Likelihood	-351.659	-348.605	-334.824	-332.460

Note: Standard errors are in parentheses. There were 2,107 total observations over time.  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 2: Results of Negative Binomial Regression of Number of News Media Stories, 1998-2004 (n = 120).**

	Models			
	Base	Network	Coalition	Full
Professionals	-0.742 (0.510)	-0.701 (0.500)	-0.750 (0.500)	-0.743 (0.490)
Financial Services	-0.475 (0.510)	-0.571 (0.500)	-0.633 (0.510)	-0.694 (0.500)
Labor	-0.209 (0.470)	0.080 (0.470)	-0.231 (0.460)	0.041 (0.460)
Private Employers	-0.907* (0.490)	-0.866* (0.470)	-2.034*** (0.630)	-1.882*** (0.630)
Expense/Domain	0.001 (0.002)	0.001 (0.003)	0.003 (0.002)	0.002 (0.003)
Staff	0.059 (0.045)	0.070 (0.045)	0.036 (0.043)	0.049 (0.043)
Policy Domains	0.001 (0.013)	-0.006 (0.013)	0.002 (0.012)	-0.006 (0.013)
Longterm	0.551* (0.290)	0.544* (0.290)	0.324 (0.290)	0.343 (0.290)
Bush Recession	0.396*** (0.086)	0.319*** (0.088)	0.423*** (0.086)	0.348*** (0.088)
Bush Recovery	0.329*** (0.087)	0.202** (0.096)	0.347*** (0.086)	0.220** (0.096)
Issue Centrality		0.008 (0.062)		0.018 (0.060)
Agenda Overlap		0.378 (0.490)		0.320 (0.490)
Membership Constraint		-0.271* (0.140)		-0.266* (0.140)
Membership Centrality		0.005*** (0.002)		0.004** (0.002)
Coalitions			0.111*** (0.040)	0.102** (0.042)
Constant	0.594 (0.530)	0.604 (0.520)	0.568 (0.530)	0.602 (0.520)
Log Likelihood	-1346.552	-1340.746	-1342.588	-1337.683

Note: Standard errors are in parentheses. There were 835 total observations over time.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

**Table 3: Changes in Lobbying Organizations' Selection of Bills, 1999-2000 (4 six-month time periods)(190 lobbying organizations, 311 legislative bills)**

Periods	No Bill (0 => 0)	New Bill (0 => 1)	Drop Bill (1 => 0)	Keep Bill (1 => 1)
1 <sup>st</sup> half 1999 ==> 2 <sup>nd</sup> half 1999	58389	254	124	323
2 <sup>nd</sup> half 1999 ==> 1 <sup>st</sup> half 2000	58188	325	181	396
1 <sup>st</sup> half 2000 ==> 2 <sup>nd</sup> half 2000	58189	180	188	533

**Table 4: Longitudinal Model of Lobbyist-Bill Network Changes, 1999-2000**

	Est.	S.E.
Rate parameter 1 <sup>st</sup> half 1999 ==> 2 <sup>nd</sup> half 1999	2.6177	0.2471
Rate parameter 2 <sup>nd</sup> half 1999 ==> 1 <sup>st</sup> half 2000	3.0446	0.2560
Rate parameter 1 <sup>st</sup> half 2000 ==> 2 <sup>nd</sup> half 2000	2.6693	0.2082
Outdegree (density)	-4.6852	0.4477
Indegree - popularity of bill (sqrt)	0.4033	0.0508
4-cycles	0.0240	0.0031
Bill progress	0.0944	0.0334
Number of coalitions	-0.2739	0.0801
Total time in policy domain	0.2537	0.0650
Number of bill cosponsors	0.0026	0.0007
Committee member	0.2419	0.0897
Hearings	0.5579	0.1625
Agenda overlap	1.6908	1.5022

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