

The Effect of Intergovernmental Associations on the Structure of Intergovernmental Networks
Relations among Kentucky Cities

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Abstract

Although the benefits of networking among local governments are well described, and the mechanisms through which inter-governmental relationships work are often studied, the first step in interlocal cooperation is usually overlooked. Cities make interlocal agreements within a network context, but this network and its origins are mostly ignored. There are several possible origins for this network, including similarity of the jurisdictions and shared intergovernmental institutions. The repeated interactions of mayors within these institutions can also drive networking. Institutions which encourage personal interactions in turn improve networking. A survey of Kentucky mayors' networking is used to test this theory, and while it finds that repeated interactions are a major driver of networking, shared institutions which do not have such interactions also encourage networking. The implications for the understanding of local government networks and for policy are then discussed.

Introduction

The benefits of interlocal cooperation are well known and oft rehearsed. Cooperation between cities allows both cities to gain from economies of scale (spreading the cost of public goods across more residents), specialization (allowing cities with particularly good or cheap infrastructure for certain services to sell that service to others), and strength in numbers (flooding state capitals with delegates lobbying for what cities need). There are many ways that cities can structure their cooperation or their refusal to cooperate (Agranoff and McGuire, 2003). Whatever cooperation cities have, though, begins with cities making contact with each

other. Without contact, without knowing about possible helpers, all forms of cooperation and coordination become impossible. The origins of inter-mayor contact, however, are not well understood. Most research begins with the relationships pre-existing and then investigates which relationships produce cooperation (Feiock, et al 2010), or focus on narrow geographic areas, such as a metropolis (Thurmaier and Wood, 2002) which assumes geographical and jurisdictional similarity create networks. The theories of interlocal cooperation have implicit theories of networking –that cities network with their geographic neighbors, for example. The goal of this paper is to make explicit the theories of how cities begin their relationships and generalize them to all cities, not just metropolitan jurisdictions. A better understanding of how cities begin their relationships will in turn help explain how cooperation can be fostered and what types of relationships are most valuable to cities.

Network Contact and Cities

Much of the literature on interlocal cooperation explains why two cities cooperate. Strategic reasons dominate the literature. There are the information strategies. Cities maintain ties with their neighbors to keep abreast of developments within the area (Thurmaier and Wood, 2002). They also use their ties to central governments –both central in the network sense and also the political sense –to learn new things about the rest of the world.

There are the resource and productivity arguments. Cities desire to become central actors in the global network of cities because all the resources flowing through central cities produce tremendous wealth, and having many network partners with whom to trade and cooperate produces even more prosperity (Allen, 2010). Cities form interlocal agreements

because they have financial needs for efficiency and effectiveness (Chen and Thurmaier, 2008). Metropolitan governance scholars have argued that cities contact their neighbors to address metro-wide problems since at least Ostrom, Warren, and Tiebout (1961, more recently Matkin and Frederickson, 2009). Having access to network resources generally helps cities govern (Turinni, et al, 2010).

Finally, there are the “insider” strategies. Being part of a network –or at least part of the jurisdiction –is an important component in having an actor’s interests considered (Fischel, 2001). Likewise, the multiplex relationships of metropolitan areas are used to govern the entire metropolis, and so being part of that network is an important part of being part of metropolitan self-government (Parks and Oakerson, 1993; Shrestha and Feiock, 2009). There are also external pressures on management –either city managers or elected executives –to network because doing so impresses other managers (LeRoux and Pandey, 2011) and because managers and executives are held responsible for the over-all health of cities (Matkin and Frederickson, 2009; Zemring, 2008).

The difficulty with strategic networking stories is that they require the networkers to know something about the network, and knowing the network’s shape is not usually common knowledge (Krakhardt, 1990). Networking with central actors requires knowing who the central actors are, and networking based on efficiency and effectiveness requires finding actors who can improve efficiency in serving residents. This is not to say that strategic networking does not happen, just that it is not the starting point. Knowledge of the network precedes the networking itself.

Relationships developing from existing relations are an implicit –and sometimes explicit –idea in theories of intergovernmental relations. Mayors prefer to form agreements with those whom they know and have routinely interacted (Feiock, et al, 2009). Routine interactions also cut down on the transaction costs (LeRoux, et al, 2010) and build trust (Feiock, et al 2010). Put another way, interlocal agreements come out of pre-existing relationships. Pre-existing, highly connected (dense), robust social networks are specifically cited as a driver of cooperation. Alas, little is then said about the origins of those networks.

The Origins of Networks

While the origins of city networks have not been much studied, the origins of network relations generally have. Theories of networking break down into three main categories: homophily, repeated interactions, and strategy. These theories are not mutually exclusive.

Homophily (McPherson et al, 2001) is the theory that “birds of a feather flock together.” People with similarities will tend to seek each other out in a crowd, and the similarities create the basis for forming a relationship. The more things two people have in common, the more likely they are to form a relationship, and, as it is difficult to maintain many simultaneous relationships, individuals are likely to seek out within pools of similar people those alters who are even more similar (Mehra, Kilduff, and Brass, 1998).

Homophily can also give rise to repeated interactions. When individuals have many things in common, they also have many reasons to interact. However, interactions alone can also be a foundation for the relationship. In this story, it is not that two people like to play baseball, for example, which founds the relationship. Instead, it is that two people routinely

play baseball on the same team. The repeated interactions produce and strengthen a relationship between the two (Granovetter, 1973). Having a place and time to interact builds more relationships, what Feld called a “social focus,” (1981).

If multiple social foci can be combined, this further encourages the development of relationships. If the two ball-players also work together, then the company baseball game offers an opportunity to interact in two different spheres at the same time. If they “keep running into each other” eventually these repeated interactions –work, play, family, and so on –will develop into a social relationship between the two.

Repeated interactions also undergird social capital models of networking. Multiple interactions mean that an interaction today can be matched by a reciprocal interaction tomorrow (Adler and Kwon, 2002). Routine interactions allow people to develop good feelings towards others in the group and help each other even if they have not previously met (Putnam,1995). Repeated interactions also build trust, expectations, and norms (Coleman, 1988) which foster relationships.

Given the benefits of relationships –the social capital that flows from connections – there are also strategic reasons to form network relationships. Networks are a source of information (Granovetter, 1985), and depending on density and structure can either serve to keep every member current on the same information, or can provide avenues for novel information (Granovetter, 1973). Individuals can decide which capability is more important and choose their network connections accordingly. Position in a network can also be strategic. Central actors –meaning actors who have lots of connections –can control less connected (peripheral) actors (Leavitt, 1951), monitor and modify information passing between other

actors (Brass, 1984), or they can bring disparate actors together (Obstfeld, 2005 –called “Tertius Jungens”). An individual might desire to be a central actor –or at least to know a central actor (Kilduff and Krackhardt, 1994).

In addition to the information sharing possibilities (Burt, 2004, Brass, 1995), network connections can be chosen for more direct resources as well. Individuals might choose a connection because the other person has a needed resource (John and Cole, 2000). Network position itself can also be a resource (O’Toole and Meier, 2004, Selznick, 1943, 1948, Smith, 2000). Even if there are no information or resource needs, and no major commonalities, a base amount of networking may be necessary simply because it is better to be “on the inside” when decisions are being made.

Among the scholars of local government networking, Feiock’s institutional argument addresses the most parts of all these theories. Belonging to the same institution provides a similarity to spark a relationship, the institution itself can provide repeated interactions, and the institution makes it easier to strategize about networking. The institutions of metropolitan governance, which includes councils of government and county jurisdictions along with other formal and informal organizations, provide relationships for city government to repurpose(Parks and Oakerson, 1993). Within these organizations, there is a large amount of information about the members. Even if mayors do not already know each other, reputation and social capital within the organization can be used to overcome the information gap. The institutions can also act to enforce agreements and to allow informal reciprocity arrangements (Feiock, et al, 2010).

Implicitly, the assumed origin of inter-governmental relationships is that the institution itself which provides the relationships. Two cities both affiliate with a single institution, and that similarity vouches for each city when they contemplate interlocal agreements. The affiliation provides the basis for a formal relationship which, in turn, is the source of intergovernmental cooperation. The existing institutions and the existing relationships make networking easy. It has been observed elsewhere (Stone, 1989) that maintaining networks among officials is easier when the participants like each other and enjoy networking. Socializing does require time and effort, though, so cities would need to pick and choose where and how to network. Institutions are one way that cities can narrow down their networking options. This is not the only possible way institutions could work to encourage networking.

First, the institution itself need not actually matter. Cities join institutions because they have something in common already. Colocation within a geographic area would lead to joining a council of governments. Similar economies would lead to joining an economic development group. Nonetheless, in the absence of such organizations, presumably cities would still create interlocal agreements and still contact each other. In this story, institutions are a marker of homophily, and they would predict networking regardless of the institutions' actual effect.

Second, the institution could facilitate networking through repeated interactions or a social focus. The exact nature of the institution is not important; what matters is that it provides a time, place, and subject for mayors to interact and build their network relationships. From these relationships comes cooperation. Colloquially, the "institution facilitates networking," but it is not the institution per se which matters. Joint affiliation is not enough to

produce relationships. Mayors have to actually attend the meetings and interact with each other, building the social capital which can then be repurposed into cooperation.

Third, the institutions could act as strategic go-betweens or filters. Once again, the specific nature of the institution is not important; it is the institution or organization's ability to bring people together. Two cities may not have any direct interactions, but when the first city goes to a common institution and asks for help, the second city will eventually hear about it. The two cities could then meet and decide whether to form a relationship. Absent the institution, relationships and cooperation never develop because the two cities never encounter one another.

Finally, relationships between cities could be the result of all these factors. They are not mutually exclusive. Institutions could bring people together who might have homophilous characteristics, and after long periods of repeated interactions relationships bloom. Later, those relationships become cooperation.

Apart from institutions, certain cities may be more likely to network or be more likely to attract networkers. Professionalism and city manager forms of government have both encouraged cooperation in the past, and within intergovernmental institutions some members will be more important than others. Professionals within cities belong to professional organizations –which alone creates new avenues for building relations –and have professional norms and incentives to encourage networking. Cooperative endeavors demonstrate a professional's competence as a manager. Managers also have incentives which encourage networking and cooperation. In addition to their professional incentives, part of a manager's job is finding ways to improve city services. Professionals within the city do that within their

specific policy domains –including finding opportunities for cooperation and keeping up with developments in other cities –but managers are expected to do the same across policies (Matkin and Frederickson, 2009). Lastly, while complete knowledge of the social network is beyond a particular city’s ability, it can proxy for “well-connected, central” cities by using institutional roles. A good first approximation of the well-connected cities in a jurisdiction is “officers of the intergovernmental organizations.” These officers are likely to network more than normal, first because such networking is important to getting and keeping office in the organization, and second because their position makes them good people to ask for information about other cities.

A Network of Kentucky Cities

There are, then, six non-mutually exclusive possible origins of the network connections that make interlocal cooperation possible.

- 1.) Homophily between cities
- 2.) Repeated institutional interactions (or a social focus)
- 3.) Institutional intervention to bring cities together (Tertius Jungens)
- 4.) Professionalism
- 5.) City Manager form of government, and
- 6.) Networking attraction to officers of intergovernmental organizations

If two cities have these characteristics, they should be more likely to have a relationship.

In cooperation with the Kentucky League of Cities (“KLC”), the 374 member city mayors were contacted and asked to take a web-survey (one mayor preferred to take the survey by phone, three mayors asked for hard copies which were not returned) where they were asked to indicate which of the other 373 alters they personally interacted with for official reasons. The definition of “official” was left to the mayors so as not to preclude mayors who considered networking part of their job from including those mayors; while excluding extraneous relations (as a hypothetical example: two mayors might have known each other in college, but never interact with each other now as part of being mayor). The contact letter and survey instrument are attached as Appendix 1, the question used in this study is Question 3. Early results were shown at the KLC Expo and Convention in Lexington, KY on October 11, 2012. At that time, additional mayors took the survey at the display table.

In total, 58 mayors took the survey (15.5%). All 58 are assumed to have answered question 3, even if they did not answer subsequent questions on the grounds that a relationship which cannot be recalled easily enough to check a box from an alphabetized list is not much of a relationship. Only 5 mayors did not complete the entire survey. These 58 mayors, however, referred to 161 additional mayors (for a total of 219, or 58.5% of all mayors). The sample of 58 mayors includes perfect knowledge of all connections among those 58, but it ignores most of the networking behavior –that is, revealed relationships to mayors who did not answer the survey. The 219 mayors includes all those other relationships, but there is missing data –the relationships between two cities which did not answer the survey. There is no perfect solution to this problem, so the following analysis will look at both versions of the

sample in an effort to better understand relationships. Characteristics of both samples are shown in table 1.

Table 1: Characteristics of Mayors and Cities in Each Sample

Variable	Obs	Mean	Std. Dev.	Min	Max
Mayors who answered the survey					
Mayor's Age	53	59.960	11.031	31	82
Population	58	4,406	5,897.498	129	27952
Median Income (2009)	58	39,137.800	21,890.750	10,001	134,063
Median Housing Value (2009)	57	106,478.600	52,584.200	34,010	267,999
% White	58	87.700	10.178	53.1	99.6
County Seat (1/0)	58	0.397	0.493	0	1
Years in Office	54	5.400	5.662	1	28
Female (1/0)	54	0.185	0.392	0	1
Highest degree achieved	49	2.510	1.276	0	5
All Mayors					
Population	219	7,767.059	27,593.343	103	295,803
Median Income (2009)	219	41,665.694	22,945.570	10,001	159,327
Median Housing Value (2009)	219	122,574.945	79,308.250	22,810	637,510
% White	219	88.370	10.165	.446	.997
County Seat	219	.388	.488	0	1

The mayors who responded averaged 60 years of age, 82.5% men, and 39% were the mayors of county seats. They were overwhelmingly white (only one minority –an African American) and averaged between some college and a Bachelor’s degree. They had served for 5.4 years (roughly starting their second term). The major metropolitan area in Kentucky, Jefferson County, help 9 of the 58 respondents (15.5%) By comparison to estimates provided by KLC, the sample is approximately similar in age (63% of mayors are between 50 and 69), more male (only 70% of mayors are men), and more likely to be mayors of county seats (32% of

cities are county seats, versus 40% in the sample –but not statistically significant). The population is also whiter (98% in sample against 91% of all mayors), and slightly better educated (KLC lacked means, but the median mayor had a 2-year degree, compared to a median 4-year BA or BS among the sample mayors). Finally, responding mayors are slightly longer serving than the typical mayor (most mayors in 2011 were in their first term) and slightly less likely to be from Jefferson County (17% of all cities).

While the mayors are not perfectly typical, their cities are closer to typical. The average responding city had median income of \$39,000, the average city in the sample had median income of \$41,600, and the median income in Kentucky in 2009 was \$40,000. Similarly, the average responding city had median housing value of \$106,000, all cities in sample had a median value of \$122,500, and the Kentucky median was \$117,000. Racially, the respondent cities were 87.7% white, all cities were 88.3% white, and the actual average for Kentucky was 87.8%. The samples are not exact, but they are close. Nonetheless, some care should be taken in analyzing the results. The mayors who responded may have been atypical.

The dependent variable is the existence of the relationship between $City_r$ and $City_c$, and so all the variables in the model are matrices rather than vectors. A “1” indicates that at least one mayor indicated that there was an official relationship between the two cities. The independent variables are coded differently depending on the variable as explained below.

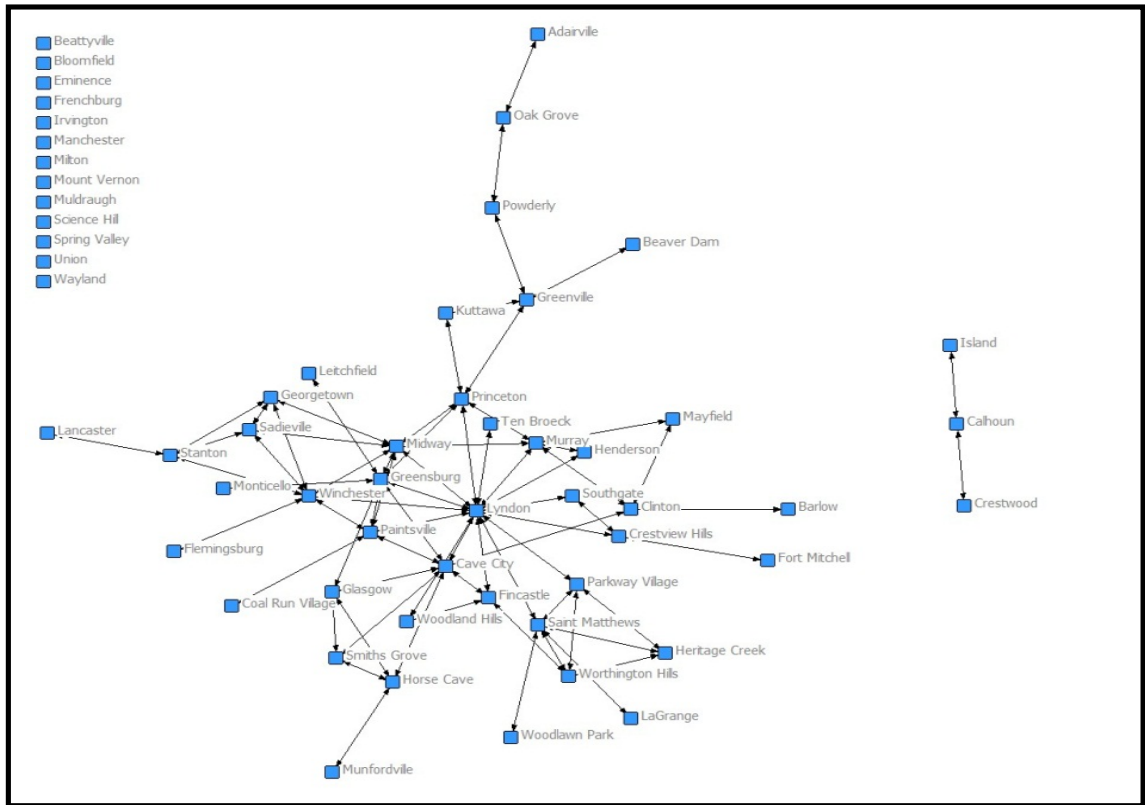
The contact network of mayors, as shown in Table 2 and Figures 1 and 2, is not dense. Nearly half (46.5%) of all mayors in the sample have only one contact. Just less than a quarter (22%) of the responding mayors have any network partners. Mayors in both samples average around 3 contacts. The averages are brought up by a handful of super-networking central

actors, most notably the city of Lyndon (the maximum in both). Both networks, while not very dense, are very centralized. They have relatively low average betweenness, meaning that there not, on average, many paths connecting two disparate cities do not pass through many third cities. Instead, there are a few cities with very high betweenness, and around 60% of cities in both samples have 0 betweenness. The network is fairly connected. Most mayors who are part of the network are part of the principle component. Only a few mayors are only in disconnected components. Finally, while not analyzed here, when given a chance to name non-Kentucky network partners, most mayors named none.

Table 2: Centrality Measures of the Networks

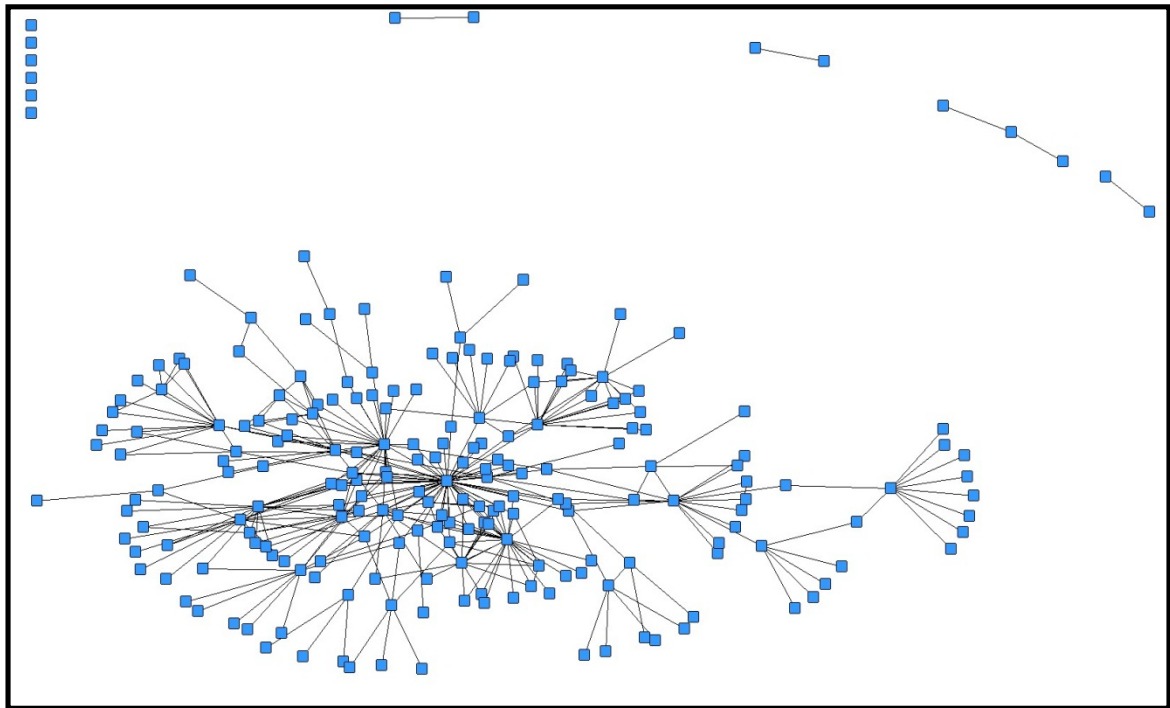
	Mean	Standard Deviation	Maximum	Minimum
Mayors who answered the Survey				
Degree Centrality	2.655172	2.844211	15	0
Betweenness	32.5345	71.90807	439.838	0
Normalized Betweenness	2.0385	4.505526	27.559	0
All Mayors				
Degree Centrality	3.13242	5.148777	54	0
Betweenness	285.2054	1097.652	13874.8	0
Normalized Betweenness	1.205813	4.640664	58.66	0

Figure 1: Sociogram of the Respondent Mayors (Generated in UCINET 6)*



*Ten Broek and Woodlawn Hills have been shifted slightly for clarity

Figure 2: Sociogram of All Mayors in Sample (Generated in UCINET 6)



Independent Variables

Similar cities are expected to be more likely to have relationships based on their homophily. In the survey, mayors were asked questions about their personal characteristics and their assessment of their city's needs, but in early analysis similarity in these characteristics and needs did not predict relationships. The data are not available for mayors who did not answer the questions, though, so in this analysis, similarity of cities is based on data which are publicly available. Population, racial make-up (measured as share non-white), median house price and median income (scaled to 10s of thousands for analysis), unemployment rate, education (share of the population with a BA or better), and age of the city were collected from city-data.com, a source of city information intended for potential movers. The city-data.com data are aggregated from other public sources, such as the Bureau of the Census. The Census data set was dated 2009. All of these variables were converted to matrices using absolute difference. As such, a larger number in $cell_{rc}$ indicates a large difference between $City_r$ and $City_c$. The effect of these differences is expected to be negative.

Economic similarity data could not be taken from city-data.com, and so were downloaded directly from the 2011 American Community Survey 5-year estimates. There are many different potential industries that could be relevant, but it is not clear that, when coded for similarity, the results are meaningful. For example, the homophily argument for service industries is that two cities with high percentages of their economy based on service would have something in common, and therefore form a relationship. However, two cities could also

look similar because neither has a service industry. Telling the first and second case apart is not possible. Nor is there an underlying factor which can be used to classify cities. However, given the prevalence of urban-rural divides in American history, agriculture is an exception to this problem. Two cities with high shares of agricultural industry are both “farming towns,” and thus have that in common. Two cities with low shares of agricultural industry are not farming towns –thus not the rural hamlet –and so have that in common. A similar argument justifies using the share of the workforce engaged in mining and forestry (extraction) but not the other occupations to gauge economic homophily. Economic similarity is rounded out with the length of the commute (taken from city-data.com). Both variables are coded as absolute differences with high values indicating two cities have little in common. Their effect is expected to be negative as well.

Finally, similar political institutions may also lead to networking. In Kentucky, cities are divided into 6 classes, which each have different powers or different levels of powers. Roughly, power increases as cities move from class 6 to class 1. Mostly, city class is determined by population, but the actual determination is made by the general assembly at the petition of the cities themselves. Cities of the same class should be more likely to network, and if they network out of their class, it will be with cities which are close in number because they are more similar. City Class data was taken from the ESRI ARCMAP data for Kentucky from 2000 (most recently available). Geographic and political data had not changed from 2000, but there were some cities which applied for and received reclassifications in 2011. They were left with their pre-2011 classification because any network relationships from 2011 would have been passed on past year classifications. City class is coded as absolute difference, with a negative expectation.

Including the homophily measures also controls for the effect of those institutions which have no effect of their own, but are indicators of underlying similarities.

Cities that share institutions are also expected to have more relationships, but institutions could work in a variety of ways, and so different institutions are needed to capture the variety of institutional effects. The first method through which institutions can increase networking is through the provision of a social focus or a place for repeated interactions. In Kentucky, Area Development Districts (ADDs) provide such a focus. The 15 ADDs are multi-county and multi-city organizations which plan, coordinate, and organize funding for economic development among their members. Importantly for this analysis, the ADDs have monthly meetings of their boards, and the boards are made up of all the member mayors and county-judge executives. Different ADDs conduct their business differently –as an example, the Purchase ADD in western Kentucky has a reputation for being a slush fund which is shared equally among all members while the Bluegrass ADD around Lexington has a reputation for providing planning services for member cities –but all ADDs bring their members together to socialize, discuss, and network. The mayors go to a single place routinely and they have topics to discuss while there. It is a social focus. They also take attendance. Membership in the ADDs was taken from the ESRI ARCMap data, and attendance was taken from the minutes of the monthly meetings between May and October 2011. Cities which share an ADD have their cell coded 1, otherwise 0, and the expected effect is positive. Because some mayors opt to send proxies instead of going themselves, a mayor's attendance was counted as 2 and a proxy as 1. The relationship was calculated by adding the attendance of $City_r$ to $City_c$. If neither mayor attended, the value is 0. If both mayors attended all six meetings, the value is 24 (6 meetings, 2

“points” for the mayor attending, times 2 mayors). Higher numbers indicate more and higher level co-attendance at the meetings –which makes mayor-to-mayor contact more likely.

Difference in total attendance (0-6) was also included to cover the effect of being the type of mayor who attends the meetings, and presumably enjoys meeting with other mayors.

The second method possible is that institutions bridge two separate cities. Rather than providing a forum for networking, these institutions can make introductions. Such organizations exist in Kentucky as well: the Community Action Kentucky Agencies (CAKs). The CAKs are non-profits which provide services for the state directly to individuals. They oversee Head Start, provide tax preparation services for the poor, and manage programs like Healthy Marriages and many more. There are 23 agencies which cover the entire state. Unlike the ADDs, these are not staffed or overseen by local officials; however, they do interact with local governments when they provide services. If sharing an agency leads to networking, it cannot be because the mayors met at the meetings, and this would be evidence for the tertius jungens theory of networking. Data on coverage by CAKs was taken from the Community Action Kentucky webpage list of agency coverage. City pairs (dyads) are coded 1 if they share a CAK, and 0 otherwise.

Because being on the inside of a jurisdiction can also matter, being in the same political jurisdictions –counties and congressional districts –were also included. It is possible, perhaps plausible, that mayors could meet at Fiscal Court Meetings, but their attendance would not be noted unless they spoke on the record, so no attempt at finding co-attendance at county meetings was made. These data were also taken from the ESRI ARCMap data. Dyads are coded 1 if cities share the same jurisdictions.

Professionalism and the form of government can also influence networking. More professional cities are encouraged to network by professional norms, and managers are also more likely to network. One major measure of professionalism is the existence of a city manager. To disentangle the effect of the manager form from the professionalism of the manager, another marker of city professionalism was also included: does the city have a webpage. The list of cities with the manager form of government was provided by the Kentucky City/County Managers Association. The list of webpages was graciously provided by a graduate student who had collected the data for their thesis. The theory is not that professionals are more likely to network with professionals, but more likely to network generally. As such, a dyad is coded 1 if either city is city-manager form. The website variable is similarly coded.

Finally, institutions can also provide strategic information for networking in the form of central actors: their officers. Mayors were marked if they were officers in either the ADDs or the KLC, and also if they were the mayor of a county seat. Officer data were taken from the ADD and KLC website lists of officers and from the minutes of the ADD meetings. County Seats were identified in the ARCMAP data. Like professionalism variables, dyads were coded 1 if either mayor was an officer or county seat.

As a control for all institutions being based on geography, crow-flies distance in miles was also included. Sociograms of the dependent variable networks are shown in figure 1 and figure 2. A summary of the density and standard deviations of the networks are shown in table 2. ADD officers are not included in the respondents sample as no officers took the survey.

The summary provided in table 2 is of the density of the network –roughly equivalent to the mean for a variable. For variables with levels, such as distance in miles, the density is equal to the arithmetic mean. Likewise, for variables with level, the standard deviation is equal to the standard deviation. For variables where the cells take only a 0 or 1 value, the density is the share of the city-pairs which have a 1, and the standard deviation is the number of city-pairs which have the relationship. The total number of city pairs for each sample is at the bottom of the table. Variables are sorted by their theorized effect and their hypothesized influence is marked in the final column.

Table 2: Network Summary of Variables (Levels indicated by units)

	All Mayors		Respondents		Hypothesized Effect
	Density	St.Dev.	Density	St.Dev.	
Homophily					
Mayor Contact	0.014	686	0.045	150	DV
Difference in Population (10k people)	1.187	3.717	0.571	0.711	-
Difference in Share of Non-White Residents (share of population)	0.11	0.127	0.098	0.095	-
Difference in Median House Price (\$10k)	7.542	8.301	6.287	6.772	-
Difference in Median Income (\$10k)	2.309	2.28	2.116	2.108	-
Difference in Population Share with at least BA (%)	16.729	16.002	14.414	12.987	-
Difference in Age of Cities (years)	59.018	48.433	60.887	44.105	-
Difference in Class (class number)	1.182	0.994	1.052	0.839	-
Difference in Share of Industry Agriculture (share of industry)	0.031	0.037	0.025	0.027	-
Difference in Share of Occupation Extraction (share of occupation)	0.063	0.05	0.053	0.037	-
Difference in Commute Length (minutes)	5.127	4.748	5.043	3.89	-

Difference in Unemployment (%)	3.88	3.366	4.053	3.248	-
Crow-Flies Distance (miles)	67.038	47.492	62.104	43.447	-
Social Focus Instituions					
Co-Attend ADD Meetings (0-24)	0.106	1.174	0.194	1.749	+
Total Attendance at meetings by both nodes (including proxies, 0-12)	2.658	2.793	3.345	3.051	+
Same ADD	0.123	5890	0.11	364	+
Tertius Jungens					
Same Congressional District	0.179	8536	0.16	530	+
Same County	0.043	2036	0.031	104	+
Same Development Agency	0.087	4142	0.069	228	+
Professionalism/Managers/Officers					
One Node is an ADD Officer	0.098	4686			+
One Node is a City Manager Form	0.133	6330	0.068	226	+
One Node is a KLC Executive Board Member	0.133	6330	0.198	654	+
One Node is a County Seat	0.627	29920	0.64	2116	+
One Node has a Website	0.325	15500	0.873	2886	+
		of 47742		of 3306	

Analysis

Two separate analyses were performed, one on each sample. The data were loaded into UCINET 6 and analyzed with the MRQAP procedure as a linear probability model. While UCINET does support logistical regression, the small size of the respondent sample made its use impractical, and so linear probability was used in order to preserve easy comparison between the two samples. The models are reported in tables 3 and 4.

Both models are have significant p-values against all coefficients being zero. The Respondent Mayors model explains more of the variation, but both models have similar results and produce statistically significant results than would be expected to appear randomly. Of the six possible mechanisms for mayor-to-mayor contact, the strongest evidence is for the social

focus and repeated interaction theory. Co-attendance is not only signed correctly and highly significant, it is also a large effect –if two mayors attend all six meetings they are between 39% (all mayors) and 63% (respondent mayors) more likely to have a relationship than two randomly selected mayors. By comparison, being in the same ADD was not significant for responding mayors and, while significant for all mayors, only improved all mayors’ likelihood of connection by 1.5%.

The evidence also supports the institutions as tertius jungens theory. Shared counties, shared CAK Development Agencies, and shared Congressional districts all increase the likelihood of two mayors having contact, though by less than repeated attendance at ADD meetings. The largest effect is the shared county. There is also some support for the strategic networking theories. Mayors appear to network with KLC Board Members. Other forms of strategic networking, however, are not generally supported in the data.

Table 3: MRQAP Model Results for Respondent Mayors

Mayor Contact	Coefficient	P-value	Std Err	Hyp. Effect	Pred?
Homophily					
Difference in Population (in 10k people)	0.02124*	0.04948	0.01369	-	N
Difference in Share of Non-White Residents	-0.04821	0.24938	0.07403	-	Y
Difference in Median House Price (\$10k)	-0.00089	0.34333	0.00225	-	Y
Difference in Median Income (\$10k)	-0.0046	0.22539	0.00647	-	Y
Difference in Population Share with at least BA	0.0001	0.44278	0.0007	-	N
Difference in Age of Cities (years)	0.00019+	0.05597	0.00012	-	N
Difference in Class	0.0003	0.47776	0.00744	-	N
Difference in Share of Industry Agriculture	0.13829	0.26637	0.2542	-	N
Difference in Share of Occupation Extraction	0.05262	0.36532	0.15511	-	N
Difference in Commute Length (minutes)	-0.0044*	0.002	0.00164	-	Y
Difference in Unemployment	0.00284+	0.06997	0.00205	-	N
Crow-Flies Distance in Miles	-0.00035	0.003	0.00015	-	Y
Social Focus Institutions					
Co-Attend ADD Meetings (0-24)	0.02587***	0.0005	0.00314	+	Y

Total Attendance at meetings by both nodes (including proxies, 0-12)	0.0001	0.45977	0.00287	+	Y
Same ADD	0.0123	0.30285	0.02696	+	Y
Tertius Jungens					
Same Congressional District	0.03776*	0.01599	0.01687	+	Y
Same County	0.15154***	0.0005	0.04134	+	Y
Same Development Agency	0.08757*	0.01149	0.03731	+	Y
Professionalism/Managers/Officers					
One Node is an ADD Officer					
One Node is a City Manager Form	-0.0558*	0.03248	0.03764	+	N
One Node is a KLC Executive Board Member	0.06863***	0.0005	0.02337	+	Y
One Node is a County Seat	0.00298	0.42879	0.0165	+	Y
One Node has a Website	-0.00873	0.28536	0.01924	+	N
Intercept	0.03857				
+ significant at .10	R-Square	Adj. R-Sqr.	P-Value	Obs	Perms
* significant at .05	0.2	0.194	0	3306	2000
** significant at .01					
*** significant at .001					

Table 4: MRQAP Model Results for All Mayors

Mayor Contact	Coefficient	P-value	Std Err	Hyp. Effect	Pred?
Homophily					
Difference in Population (10k people)	0.00019	0.24288	0.00062	-	N
Difference in Share of Non-White Residents	-0.01854*	0.04698	0.01544	-	Y
Difference in Median House Price (\$10k)	-0.00035	0.1979	0.00044	-	Y
Difference in Median Income (\$10k)	-0.00131	0.16292	0.00142	-	Y
Difference in Population Share with at least BA	0.0001	0.25537	0.00017	-	N
Difference in Age of Cities (years)	0.00006*	0.03798	0.00003	-	N
Difference in Class	-0.00213+	0.05997	0.00143	-	Y
Difference in Share of Industry Agriculture	-0.02708	0.32534	0.05328	-	Y
Difference in Share of Occupation Extraction	-0.00601	0.44678	0.03393	-	Y
Difference in Commute Length (minutes)	-0.00031	0.16242	0.00041	-	Y
Difference in Unemployment	0.00023	0.27236	0.00052	-	N
Crow-Flies Distance in Miles	-0.00007**	0.0085	0.00003	-	Y
Social Focus Instituions					

Co-Attend ADD Meetings (0-24)	0.01655***	0.0005	0.00069	+	Y
Total Attendance at meetings by both nodes (including proxies)	0.00051	0.27386	0.00086	+	Y
Same ADD	0.01432**	0.0065	0.00535	+	Y
Tertius Jungens					
Same Congressional District	0.00658*	0.01849	0.00308	+	Y
Same County	0.09671**	0.0005	0.00749	+	Y
Same Development Agency	0.0207**	0.0005	0.00643	+	Y
Professionalism/Managers/Officers					
One Node is an ADD Officer	-0.00784	0.11594	0.00796	+	N
One Node is a City Manager Form	0.00298	0.27936	0.0069	+	Y
One Node is a KLC Executive Board Member	0.02341**	0.0055	0.00697	+	Y
One Node is a County Seat	0.00189	0.32584	0.00439	+	Y
One Node has a Website	0.00626+	0.05747	0.00416	+	Y
Intercept	0.00792				
+ significant at .10	R-Square	Adj. R-Sqr	P-Value	Obs	Perms
* significant at .05	0.108	0.108	<0.001	47742	2000
** significant at .01					
*** significant at .001					

The least support is found for homophily theories. The effects of similarity and difference are weak and inconsistent between models. There is only a small, borderline significant, positive effect on the difference in city age. Differences in population also lead to more networking, but the effect is not significant in the all mayor model and only at the 5% level in the respondent mayor model. To the extent homophily leads to networking, its effect is felt through institutions.

Discussion and Conclusion

The large effect of repeated interactions suggests that networking is mostly the result of mayors interacting with each other. The primary benefit of intergovernmental institutions is to facilitate that personal interaction. Having a place to routinely talk with other mayors helps cultivate inter-governmental relationships, and is similar to the types of relations found among city officials in Kansas City (Thurmaier and Wood, 2002). It is also consistent with the cost-of-networking. Networking face to face is time consuming, but the ADD meetings bring everyone together in one room anyway.

The face to face interactions may also account for the strength of shared counties in network relationships. Unlike the other potential middleman institutions, counties provide a Judge Executive and Fiscal Court meetings where –though not formally part of the government –mayors can still expect to find each other. The Development Agencies and the Congressional Districts provide additional support for the idea that reputation through a trusted middleman can help connect mayors because they lack the meetings. Relationships coming from these institutions are likely the result of working two cities brought together for another project by either the congressional office (such as for lobbying) or the agency.

These interactions are support for the social focus, social capital, and repeated interaction theories. Whether these relationships and institutions can also be used to enforce norms of behavior during interlocal cooperation would require additional, and more detailed, research into each institutions.

Though not the strongest effect, the most interesting evidence regards the professionalism and strategic networking theories. The trappings of professionalism have an unclear effect on networking. This might be because professionalism is not very strongly

influencing behavior, or professionalism could be channeled through ADD attendance and other activities directly measured. In this case, professionalism's effect would be indirect, but determining that will require further research. Strategic networking, though, had a split effect that was consistent across models: mayors network with KLC executives, but not with ADD executives. Recall, none of the ADD executives even answered the survey, but some were at least mentioned. KLC executive board members answered the survey and were also frequently cited as contacts. The possible reasons for this result open up additional lines of research.

First, the split could be the result of electioneering. KLC executives are nominated and elected by the membership of KLC. ADD officers are also elected, but the ADDs rotate officers, have a committee structure, and officers may be only *primus inter pares*. In this circumstance, there is an incentive for KLC executive board members to network far and wide in order to get votes. This would account for the different behaviors.

Second, mayors could have taken to heart Granovetter's arguments about the strength of weak ties. Mayors see the other ADD members every month. Knowing the officers better does not produce additional information. Most mayors, however, only encounter other member-cities infrequently—only once per year at the convention and exposition is guaranteed, and many cities skip even that. KLC executive board members would be an outside contact to cultivate in order to get access when necessary to additional information from mayors outside the ADD and narrow geographic region.

Third, the value of a KLC executive relative to an ADD officer may be related to the *tertius jungens* role KLC tries to play. This could not be measured directly because every mayor responding to the survey was a KLC member. When a mayor wants to form a relationship or

forge an agreement with a fellow ADD member, there is no need to call in a mediator or get an officer to vouch for the quality of the other mayors. Mayors can evaluate their peers at the meetings personally. This is not possible outside the ADDs and the Counties. For cooperation beyond the immediate region, a middleman is necessary, and KLC Executive Board members could fill that role. These three explanations are not mutually exclusive.

Ultimately, mayors form their network in several ways and for a variety of reasons. Face to face communication, and the institutions which facilitate it, are clearly important, though. More than similarities between cities, it is time spent networking and the institutions which mediate mayor relationships which lead to inter-city contact. The role of these institutions should be considered when discussing interlocal cooperation. The state-wide network also indicates that mayors do not stay within well-defined geographic jurisdictions when they network. Even though Kentucky mayors generally did not network across state borders, they still did so occasionally. They were much more permissive across county and metropolis borders within the state. This suggests both a point for researchers to keep in mind when they choose their unit of analysis, and also a point for policymakers when thinking about interlocal cooperation across jurisdictions. Institutions which cross borders would facilitate this networking and, by extension, improve cooperation across local governments.

Appendix 1: Contact Letter and Survey Instrument for Survey of Kentucky Mayors

1 September 2011

Dear Mayor (mayor's name);

My name is Matthew Howell, and I am writing my dissertation on local government organization in the Martin School of Public Policy and Administration at the University of Kentucky. Many local governments serve their residents by building relationships with other local governments. Some cities coordinate their city functions like urban planning or public safety services, while other cities maintain social, business, and community ties. For residents and officials, local government is a network of governments.

However, this facet of local government is still poorly understood. In conjunction with the Kentucky League of Cities, we would like your help in better understanding how these government networks form by answering a short survey about yourself, your city, and the other mayors you interact with. This data will help improve our understanding of local government, but it will also help the Kentucky League of Cities (KLC) serve you better by showing the network of local governments –which can be used to plan trainings, events, seminars, and other services and support.

If you are willing to help build our knowledge of Kentucky local government, please answer the questions by October 7th at:

<https://www.surveymonkey.com/s/KYmayors>

If you cannot fill out the survey online, I can mail you a hard copy, or you will be able to add your experience to the database at the KLC Conference and Expo in Lexington on October 4-7. A hyperlink will also be in the KLC Direct Line e-newsletter.

Your information cannot be made anonymous or confidential. The data will be made available on the web through KLC, allowing you to see the whole network and your place in it. The final report will also be available through KLC, or via my contact information below. If you have any questions, do not hesitate to call or e-mail me.

Thank you for helping us improve our knowledge of local government and improve the Kentucky League of Cities' service to you.

Sincerely,

Matthew L Howell

Martin School of Public Policy and Administration

University of Kentucky

mlhowe2@g.uky.edu

(859)-327-1221

Consent to Participate in
A
Survey of the Social Network of Kentucky Mayors
And
Select Antecedent Relationships that Support the Network

Principal Investigator: Matthew Howell

Martin School of Public Policy

University of Kentucky

Thank you for helping us learn more about the social network of Kentucky Mayors. This survey will ask you about your city's policy issues, which other mayors you interact with, and some questions about you. I hope to learn from your answers how Kentucky Mayors are connected to each other, and what leads to these relationships.

The principal investigator for this study is Matthew Howell, a PhD candidate in the Martin School at the University of Kentucky. Assisting in this is Edward Jennings, PhD, a faculty member and the dissertation advisor for this project. You may contact Matthew at any time with questions about the study, or you may contact the UK Office of Research Integrity with questions about how we treat your data.

Matthew L Howell, Martin School

mlhwe2@g.uky.edu

(859) 327-1221

Helene Lake-Bullock, ORI

helene.lake-bullock@uky.edu

(859) 257-5943

Before beginning, you should know that network surveys cannot be confidential, and the data from this survey will be available on the web. This will allow you and other to see your position in the network of mayors. Even removing your name from the data, your city and location could still be determined. If you do not wish to participate in this survey, do not continue. Participation in this survey is up to you and no one will be mad if you choose not to participate or later decide to opt out. You can quit the survey at any time.

Continuing to the survey means that you have read this page or had it read to you and you want to be in the study. You agree that you have been told about this study and why it is being done and what to do. It should take 15-30 minutes at the longest, depending on how many contacts you have.

Thank you again for your help.

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If you wish to take this survey, please sign and print your name on the lines below and return it with your survey. This signifies that you have been told about this study, why it is being done, and what to do. It should take 15-30 minutes at the longest to complete, depending on how many contacts you have.

Thank you again for your help.

Signature of person agreeing to take part in the study

date

Signature of authorized person obtaining informed consent & date
study

Printed name of person agreeing to take part in this

Survey of the Social Network of Kentucky Mayors

Thank you for taking the time to answer these questions. Your cooperation will help expand the knowledge of how local governments can better serve their residents, and improve the ability of organizations such as the Kentucky League of Cities to support local governments. Thank you again for your help.

Before beginning select your name and city from the list.

1. What are three major issues that you consider most prominent in your city?
 - 1) Purchasing and Inventory
 - 2) Balanced Budget
 - 3) Taxes
 - 4) Recession Response
 - 5) Public Safety
 - 6) Economic Development
 - 7) Collective Bargaining
 - 8) Street Construction and Civic Engineering
 - 9) Sewage and Solid Waste Disposal
 - 10) Civic Event Management
 - 11) State or Federal Grant Applications
 - 12) Zoning and Land Development
 - 13) Developing relationships with other governments
 - 14) Strategic Planning
 - 15) Other

2. Which three of these groups or people are most prominent in your city?
 - 1) Local Development Corporations
 - 2) County Government
 - 3) Chamber of Commerce
 - 4) Local Utilities
 - 5) Neighborhood Associations
 - 6) Special Districts
 - 7) Private Industry Council
 - 8) Individual Businessmen
 - 9) Church Committees or Leaders
 - 10) Racial, Cultural, or Ethnic civic leaders
 - 11) Civic Organizations (Rotary, Lions, et cetera)
 - 12) Other

3. What Kentucky mayors and their cities do you personally interact with as mayor for official reason?
4. What non-Kentucky cities do you personally interact with as mayor for official reasons?

Please answer some questions about yourself:

1. Age
2. What was your profession before you got into politics?
3. What office, if any, did you hold before running for mayor?
4. How long have you been mayor?
5. Sex/Gender
6. Race/Ethnicity
7. Where did you receive your last degree? In what year?
8. What opportunities do you take to network?

This information is very useful to understanding how mayors choose to interact with each other. Equally helpful, though, are the details of your work, which can provide special information not picked up in surveys, such as what type of relationships you have and how important you consider them. Would you be willing to talk about your city and your relationship with other mayors in a follow-up interview?

No

Yes

Would you like to receive a copy of this report at its conclusion?

No

Yes

What is your contact information?

Finally, what are some opportunities that you would like to see the Kentucky League of Cities offer to better help you communicate with your fellow mayors and cities? Particularly, are there internet devices like mailing lists, social networking software, or apps that you would like to see?

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