Turnover, Interlocal Collaboration and Organizational Performance: Testing Mediator and Moderator Effects

Chien-shih Huang and Yixin Liu*

Abstract

That leadership turnover produces profound organizational outcomes has been documented in the public management and urban governance literature. However, empirical evidence regarding the turnover-performance relationship so far still remains elusive. To disentangle their mix associations, this study investigates the mediating and moderating role of interlocal collaboration. Theoretically, interlocal collaboration can be an appealing institutional arrangement for policy problems which single governments actions cannot fully or efficiently solve. And interlocal collaboration can potentially affect the turnover-performance in two ways. Leadership turnover may initiate the reassessment of the adoption of such institutional arrangement, so institutional restructure following turnover events would exert impacts on organizational performance. On the other hand, the interdependency between collaborative partners embedded in policy problems and past interactions could preclude unilateral termination of collaborative relations, leaving new leaders who cannot reselect partners at their will, but need to manage the existing collaboration with limited human and social capitals incapable of reversing and maintaining a trend. To test our hypotheses, we collected the data of leadership turnover, interlocal agreement in police services, and crime incidents in Nebraska from 2012 to 2018. Using system generalized method of moment model, empirical findings reject the mediation effect while causally support that the size of interlocal collaboration network moderates the positive effect of executive turnover on organizational performance.

Keywords: Executive turnover, Interlocal collaboration, Organizational performance, Longitudinal analysis

*Chien-shih Huang is a postdoctoral fellow at the Department of Environmental Science and Policy, University of California Davis, csihuang@ucdavis.edu. Yixin Liu is a PhD candidate at Askew School of Public Administration, Florida State University, yl17g@my.fsu.edu.

Introduction

Recently, organizational outcomes of leadership and employee turnover have been a central topic in organizational studies for both private and public organizations (for a review see Farah, Elias, DeClercy, and Rowe 2020; Mawdsley and Somaya 2016). Scholarship has examined how the movement of organizational members leads to innovative behaviors (Teodoro 2011; Yi, Berry, and Chen 2018), remaining members' attitude (Felps et al. 2009; Geys et al. 2020; Shapiro et al. 2016), organizational change (Villadsen 2012, 2016), interorganizational collaboration (e.g., Clingermayer and Feiock 1997; Yi and Chen 2019) and organizational performance (e.g., Hill 2005; Lee 2018; Meier and Hicklin 2008; Wynen et al. 2019). Among them, the turnover-performance relationship seems to be inconsistently observed, which calls for more work to be done in order to disentangle the way that turnover events exerts impacts on organizational performance. Following Baron & Kenny's (1986) argument, our proposed solution to these inconclusive results is to examine how the third variable affects the relationship between independent and dependent variables of interest.

The focus in this paper is organizational performance, in particular annual crime incidents, because recent studies shows voters would make elected officials accountable for this kind of performance indicator (Arnold and Carnes 2012). Also, the authors believe that interlocal collaboration can be a potential mediator or moderator in the proposed model of the turnover-performance relationship, since collaborative governance has become a crucial and common approach for public organizations to solve wicked problems and overcome diseconomies of scale (Ansell and Gash 2008; Emerson and Nabatchi 2015; Feiock 2013). Previous studies have suggested that distinct collaborative patterns can be beneficial for the focal organization by bringing novel information or strengthening commitments to achieve shared goals (e.g., Hansen and Villadsen 2017; Ryu 2017). And leadership turnover can hinder or help partnership working, as documented in prior literature (e.g., Clingermayer and Feiock 1997; Feiock, Clingermayer, and Dasse 2003; Yi and Chen 2019). Based on this, this study brings together these seemly disparate concepts in the literature and offer

a more comprehensive picture of the turnover-performance relation to solve the theoretical puzzle. The main purpose of this study is therefore to investigate the relationship between leadership turnover and organizational performance, taking into account the potential meditation and moderating roles of interlocal collaboration. By doing so, we expect to advance our knowledge on the underlying mechanism through which leadership turnover results in particular organizational consequences.

Collecting a unique dataset of interlocal agreements and leadership turnover from official documents, we study the turnover-performance relationship of 93 counties in the state of Nebraska from 2012-2018. In particular, we empirically examine and compare the size of collaborative partners, the number of new and terminated partners in the realm of police services as well as the turnover ratio of elected officials at the county level that are expected to explain the fluctuation of annual crime incidents. The results of system generalized method of moments (System-GMM) support the postulated moderation effect of interlocal collaboration on the turnover-performance relationship, rather than the meditation one. We show that leadership turnover would be adverse for organization performance when there are several public service deliveries partnerships which have existed before turnover events and may not be abolished unilaterally after the succession of new leaders. While our findings are majorly based on the case study of Nebraska, they suggest that a deeper understanding of the mechanism behind the turnover-performance relationship is warranted.

The study proceeds by providing a brief review of the literature on leadership and employee turnover and their impacts on organizational performance. We then elaborate our theoretical model, suggesting that interlocal collaboration as the potential mediator and moderator for the turnover-performance relationship. Next, we will provide a detailed description of data sources, the measurement of independent and dependent variables, as well as analytical strategies. In the result section, we provide the summary of the empirical evidence which is followed by discussion and conclusion that illustrate theoretical and practical implications.

Turnover and Organization Performance

Turnover events, broadly speaking the movement of organizational members and/or leaders, can impose substantive impacts on organizational outcomes at the individual, units, and organizational levels (Mawdsley and Somaya 2016). Conceptually, whether turnover events are beneficial or harmful for organizational performance would primarily depend on the loss and gain of human or social capital along with personnel department and replacement.

Conventional viewpoint is that turnover events are equivalent to talent drain, so organizations tend to adopt managerial strategies to prevent the separation of organizational members (Moynihan and Landuyt 2008). From the human capital perspective, the outflow of personnel would be a threat of losing critical working skills and knowledge which can be carried out by leaving organizational members from one organization to another. The focal organization would then fail to get the payoff of the investment in firm-specific human capital (Becker 1962). More importantly, when the voluntarily leaving members are good performers who often have more opportunities for career advancement, the assumed human capital deprivation can severely interrupt organizational productivities (Hur 2013). In addition, the social capital perspective suggests that a single episode of turnover event could produce a ripple effect through the established social relations within and outside organizations. Within the focal organization, turnover events can be contagious because employees would feel increasing uncertainty and ambiguity in the workplace, after making social comparison by viewing the leaving co-workers and supervisors as reference points (Felps et al. 2009; Geys et al. 2020; Shapiro et al. 2016). Also, the replacement of new organizational members after turnover events can destabilize the established working routine, increasing coordination costs of teamwork and then reducing team performance (Michele Kacmar, Andrews, Van Rooy, Chris Steilberg, and Cerrone 2006). This is especially the case of new managers who are externally recruited, because they may have insufficient social capital to manage the existing relationship between stakeholders and use it to buffer external shocks (Hill 2005). In terms of interorganizational relationship, studies have demonstrated that the buyer-seller relations would be at the risk of dis-

solution with the departure of boundary spanners who have accumulated relation-specific assets between transactional parties (Broschak 2004; Broschak and Block 2014; Burt 1992)

Yet other streams of studies have presented counterarguments that turnover events may not always produce negative consequences. Turnover can replenish novel human and social capital, making organizations more adaptive to complex and challenging external environment. First, leadership changes could be helpful to turn poor performance around, as new leaders, compared to the old one, are more open up to new idea and are more willing to implement the potential reform on obsoleted practices (Boyne, John, and Petrovsky 2011; Connolly 2018; Teodoro 2011). And indeed, the positive effect of the infused novel idea via turnover events on organizational performance may not be linear but non-linear, as the level of task complexity increases (Meier and Hicklin 2008). Second, turnover can correct misplacement problem and then increase job satisfaction. Relocating a small portion of employees to the units they are more satisfied with and can further pursuit their career goals can be one way to optimize the utilization of human capital, so achieving the optimal level of turnover can boost organizational performance; otherwise, too many turnover can be disadvantage of organizational outcomes (Lee 2018). Third, the mobility of organizational members not only encourage organizational learning, but also increase the likelihood of connecting interorganizational relationship which would otherwise be disconnected. Studies have presented that new leaders can also introduce new practice based on their prior working experiences when the institutional environment of the new workplace is comparable to the prior one (Yi and Chen 2019; Yi et al. 2018). And private sector studies have demonstrated business relationships could be enhanced due to the employee mobility between cooperators (Somaya, Williamson, and Lorinkova 2008).

Given the inconsistent findings of the turnover-performance relationship, some studies start to explore the effect of third variables. Most examine the moderating factors regarding the nature of turnover events (e.g., Hausknecht and Holwerda 2013; Nyberg and Ployhart 2013) and the nature of task (e.g., Ton and Huckman 2008; Wynen et al. 2019). Different from them, we choose to explore the potential mediation and moderation effect of collaborative relationship between gov-

ernmental agencies. This is because intergovernmental collaboration has been widely viewed as one factor affecting organizational performance (e.g., Meier and O'Toole Jr. 2003; Provan and Milward 1995). And public managers often need to make a strategic decision on whether to participate in and maintain join efforts with other governmental agencies to address public problems whose impacts would spill over political jurisdiction. It is their specific partner selection and collaborative management practices that can determine organizational performance. Hence, if there is an impact of turnover effects on organizational performance, changes in the dynamic of interorganizational collaboration would be one crucial underlying mechanism wait for further exploration. In the next section, the postulated effects of interlocal collaboration as a mediators or moderator between leadership turnover and organizational performance will be discussed in greater detail.

The mediating role of interlocal collaboration

Collaboration governance is a strategy to help governmental actors to deal with public issues by engaging with governmental and non-governmental actors outside the focal organization in the policy process to achieve acclaimed policy objectives (Ansell and Gash 2008; Emerson and Nabatchi 2015). Particularly, intergovernmental collaboration can be one type of organizational arrangement for tackling wicked policy problems which require collective efforts from multiple governmental agencies or for delivering public services which single governmental agencies may not be able to provide by themselves in a more efficient way (e.g., Elston, MacCarthaigh, and Verhoest 2018; Feiock 2013). Such intergovernmental arrangement can enhance governance capacities, increasing the likelihood that the complex problems could be resolved, and the desired policy outcomes can be obtained.

As shown in the stream of public management literature, managerial networking outward, including other governments and non-governmental stakeholders could make substantive impacts on policy outcomes and service delivery. For example, using the survey data of Texas school districts, Meier, O'Toole and their colleagues have demonstrated a positive association between managerial networking and school performance (e.g., Meier and O'Toole Jr. 2003; O'Toole, Meier,

and Nicholson-Crotty 2005). Other scholars also observe a similar pattern in the realm of police services (Nicholson-Crotty and O'Toole Jr. 2004) and local fiscal health (Jimenez 2017). This would occur because managerial networking could stimulate policy learning across organizations, acquire resources and supplementary skills from other actors, as well as garner community support and trust; these benefits can then contribute to the accomplishment of organizational objectives that can only be obtained by join forces, rather than disparate actions taken by single government (Agranoff and McGuire 2003; O'Toole Jr. 1997). It worth noting that managerial networking may not always be good for public organizations O'Toole Jr. and Meier (2004). And distinctive networking patterns could lead to specific outcomes at the network level (e.g., Provan and Milward 1995) and the ego level. For ego governmental entities, building strong and weak ties can serve for different managerial purposes related to managers' characteristics and organizational environment (Hansen and Villadsen 2017). And a particular networking pattern could push performance upward or downward due to the type of resources transmitted via networking which may or may not be suitable to mitigate uncertainty in the external environment (Ryu 2017; Yi 2018). These findings suggest that public organizations would need to strategically do partner selection which would in turn determine the governance capacities of addressing complex problems.

On the other hand, urban studies alike recognize the importance of intergovernmental collaboration, in particular, in the form of interlocal agreement in service delivery. Different from managerial networking, interlocal agreements can be labeled as a "collaborative efficiency measure", a notion means that "multi-organizational arrangements designed to achieve levels of productive efficiency and cannot be achieved, or achieved easily, by single organizations" (Elston et al. 2018, 1818). As indicated in the prior studies, the main rationale behind this type of intergovernmental collaboration can be the rectification of scale mismatch (Ostrom et al. 1961), the deterioration of fiscal conditions (Aldag, Warner, and Bel 2020; Bel and Warner 2016; Bel, Fageda, and Mur 2012), the improvement of public services quality (Agranoff and McGuire 2003; Chen and Thurmaier 2009; Thurmaier and Wood 2002) or sometime a bunch of these together. That is, integrating activities taken by different levels of governments through regional cooperation can reduce resource

waste and enhance service outputs in the context where local authorities are highly fragmented and overlapped. No matter what reason underlying the adoption of interlocal agreements, local government would need to evaluate the comparative benefits and costs derived from specific service delivery arrange, namely produce in-house or buy from others (Brown and Potoski 2003; Feiock 2013).

In our setting, we focus on interlocal agreements regarding police services. There are two reasons for choosing this service area. Frist, public safety is a salient issue the local government need to address, because citizens would make leading local officials accountable for the crime incident as one performance indicator (Arnold and Carnes 2012). If interlocal collaboration can improve organizational performance as the literature suggested, we then expect leading officials of local government would consider this service arrangement as a viable option. Indeed, police service is one type of public services which oftentimes encountering the issue of diseconomies of scale, as many studies highlighted (Andrew and Hawkins 2013; Andrew, Short, Jung, and Arlikatti 2015; Ostrom 1975; Ostrom, Parks, and Whitaker 1978). While sharing capital-intensive services, such as dispatch and communication technology, are more likely to be achieved, local residents in affluent communities often resist to share labor-intensive services, such as police patrol, with other communities and want to enjoy exclusive such benefit by themselves (Carr and LeRoux 2005). In so doing, the production and provision of police services for poor community would be suboptimal. In spite of the obstacle on interlocal collaboration, sharing police service with other local governments has the potential to reach economies of scale regarding the provision of public services from the viewpoint of local officials (Zeemering 2019).

Given the influences of interorganizational collaboration on organizational performance, the question of interest would then turn to be what the relationship between leadership turnover, interlocal collaboration and organizational performance might be. One speculation is that leadership turnover can modify the preference of local governments on the choices of intergovernmental collaboration which would then change organizational performance. This would be the case because, as mentioned before, turnover can restructure the repositories of human and social capital of the

focal organization and its collaborators. From the viewpoint of transaction costs, credible commitments and enforcement of interlocal agreement with a fair distribution of cost and benefits cannot be guaranteed, once one party of the transaction experiences turnover events of leading officials (Feiock et al. 2003). Hence, more turnover events would prohibit the adoption of interlocal collaboration.

Due to different education and managerial background as well as career goals, new leaders may assign different values to interlocal collaboration, as opposed to their predecessors. For example, city managers with progressive ambitious are more likely to be the seller and less likely to be the buyer of the interlocal service delivery (LeRoux and Pandey 2011). Managers with self-development attitude are more likely to engage in interorganizational collaboration (Esteve, Boyne, Sierra, and Ysa 2013). As a result, the change of leading local officials can be open the opportunity window for building new interlocal collaboration and terminating the old ones.

In addition, as more turnover events happen within the organization, the focal organization might seek for interlocal collaboration as alternative to maintain the level of service delivery, although the results may be promising as expected because of the loss of contract managing capacities accompany with turnover events (O'Toole Jr. and Meier 2004). Finally, elected officials would adopt interlocal collaboration to avoid blame and ensure the win for re-election amid political conflict and turmoil (Clingermayer and Feiock 1997). Given these pieces of empirical evidence suggest turnover events can be correlated with the inclination of interlocal collaboration which can in turn affect organizational performance, we then hypothesize:

> **H1. Mediation Hypothesis**: Interlocal collaboration mediates the relationship between leadership turnover and organizational performance.

The moderating role of interlocal collaboration

Although newly elected officials have ambitions to make progressive change of existing interlocal network structure, institutional constraints and their limited capacities would make them fail to achieve this goal. These newcomers need time to get familiar with the tacit knowledge within

the organization and outside political/social ecosystem. As thus, they may not have extra energy in changing the complex network structure in interlocal service delivery.

Within the organization, personnel unfamiliarity is the first obstacle for newly elected officials. Unlike frontline employees who can simply follow the rules and finish the tasks assigned from supervisors, the process of acclimatization for elected officials is multifaceted (O'Toole Jr. and Meier 2003). They face difficulties not only in interacting with retained members in the existing decision-making commission, but also in communicating with subordinates and other employees in the organization. Moreover, newly elected officials works would be challenged by unfamiliar institution, organizational culture, and administrative system. Signing or terminating an interlocal agreement with another political entity is an important and formal action for an organization, which often need consensus among decision-making members and effective implementation from front-line employees. The personnel and institutional unfamiliarity may limit the organization's capacity to achieve it in a short time.

If the internal unfamiliarity may be overcome by organizational solidarity and excellent leadership, external environment is often hard to control. Interlocal agreement is not a unilateral action, in some cases parties can be even more than bilateral. Interorganizational collaboration, is largely affected by the regional network structure and the complex relationship among multiple network actors (Scott and Thomas 2017). Therefore, newly elected officials have to get familiar with the political/social ecosystem surround their jurisdictions before they make formal collective decisions. Compared to internal factors, newly elected officials may need even longer time to adapt with external environment.

In addition, institutional constraints can restrict the potential for structuring service arrangement at will. Interlocal agreements as formal contracts often have exact expired dates that cannot be easily modified or terminated unilaterally. This objective reality limits newly elected officials' discretion in changing the network structure. More importantly, once they participant in joint ventures with other governments, interdependency between participating parties would be intensified, locking them into this type of service arrangement (Elston et al. 2018; Zeemering 2019). Such

path dependency could be more predominant in the realm of police services, because their potential collaborators would not be open to non-profit or private organizations but confined to other governmental agencies. Even if they choose to produce in-house, they would need to pay a large amount of start-up costs, an option which cannot be affordable for poor communities.

Overall, turnover event forms a "government of strangers" (Heclo 1977). Unfamiliarity of both internal and external issues postpone a new managerial team to change existing interlocal network structure from its predecessor. Although former literature suggests that executive turnover can positively correlate to organizational performance, we may not conclude that this positive effect is mediated by changing the interorganizational collaboration. In other words, newly elected officials have incentives to prompt their performance, but they may not have capacity to achieve it through interlocal collaboration. The theoretical relationship between executive turnover, interlocal collaboration, and organizational performance may not be a two-step progressive relationship, but a more complicative crossover.

Given the difficulty in changing network structure as discussed, newly elected officials have to compromise with the existing collaboration relationships. Therefore, interlocal collaboration is a moderator rather than mediator between executive turnover and organizational performance. Consistent with previous argument, we assume that turnover positively affects organizational performance. However, this positive effect is moderated by the network size of interlocal collaboration partners. We explain this argument by using the social capital theory as following.

In local politics, if improving government performance is the promise before public officials being elected and also their indicators for future reelection, they would have willingness to overcome difficulties and achieve this goal within their control. However, if the goal of performance improvement requires intergovernmental collaboration that is out of unilateral control, they have to cope with collaborative partners. Successfulness of collaboration often relies on mutual trust, competence, flexibility and commitment among collaborators, which are combinedly known as social capital (Burt 1992; Granovetter 1985; Ostrom 1998). At the collective level, social capital often refers to "bonding forms" that facilitate network actors to connect with each other, increasing com-

munication efficiency, and strength internal ties among them (Adler and Kwon 2002). When social capital accumulates and collaborators are tightly connected, transaction costs decrease among each unit and collective performance is finally improved (Coleman 1988). When social capital lost, collaborators would no longer hold mutual trust and barrier-free communication with each other, whereafter, the bonding ties dissolve and collective outcome cannot be achieved.

Studies from private sector show that executive turnover leads social capital loss (Broschak and Block 2014; Shaw, Duffy, Johnson, and Lockhart 2005). This effect is severe in a complex network structure, where employees with multiple interorganizational connections leave their positions. Then the social capital loss is not in one department or organization but in all connecting units. Organizations thus lost valuable channels to bridge their information. Broschak and Block (2014, 760) have found that the social capital loss is critical when the leaving employees are executive managers who "develop a deep understanding of their exchange parties process, in-depth technical knowledge about their exchange partners businesses, and trusting personal relationships that reduce uncertainty about malfeasance." Following turnover events, social ties dissolve and structural holes appear.

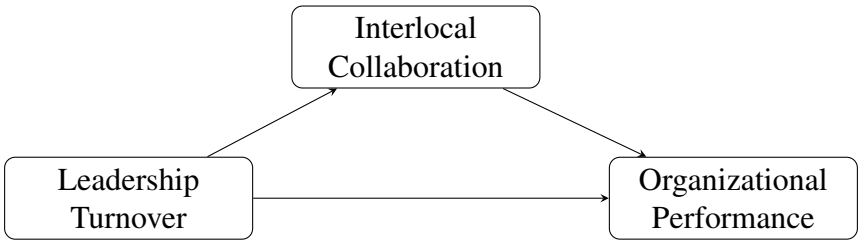
We assume that association between turnover and social capital in private sector is similar in public sector, though few researches locate investigation on this regime. As O'Toole Jr. and Meier (2003, 46) mentioned, "turnover among politicos has exacerbated the difficulties involved in building competence, mutual trust, and long-term commitment." Ambiguity and complexity increase in the network when powerful leaders, like elected officials, leave or join in a collaboration (Bryson, Crosby, and Stone 2006). A new management team has to maintain the existing collaboration with other parties by the nature of formal agreements and the constraint from inside and outside of the organization. For the "government of strangers", a remaining network heritage from their predecessors is no longer a valuable social capital but a group of unfamiliar units. Even if formal agreements between them still exist, social capital cannot be reestablished in a short time (Emerson, Nabatchi, and Balogh 2012; Ostrom 1998). Therefore, we argue that social capital loss become more salient when the size of collaborators is large, the difficulty and complexity of newly

elected officials to cope with their collaborators exaggerate, and eventually the positive effect from executive turnover to organizational performance will be moderated.

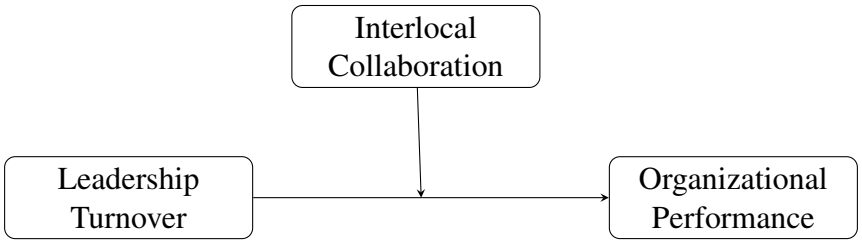
Although not explicitly address the relationship between turnover and collaborative performance, public leadership literature is another reference to suggest the above moderating effect. Abundant evidences have indicated the importance of leadership in collaborative governance. Effective leadership facilitates interorganizational communication, guides the process of collective actions, and balances powers between stakeholders (Ansell and Gash 2008; Martin, Currie, and Finn 2009; Waugh Jr and Streib 2006). Therefore, stability of leadership is important for collaboration success, but turnover disrupts stability of network (Agranoff 2006; O'Toole Jr. and Meier 2003). Based on the above rationale from social capital and public leadership literature, we purpose the following argument:

H2. Moderation hypothesis: Interlocal collaboration moderate the relation between leadership turnover and organizational performance

Taken together, we summarize the models as the conceptual map illustrated in Figure 1 below:



(a) Mediation Model



(b) Moderation Model

Figure 1: The Theoretical Models

Research Design

Measuring interlocal collaboration

To test the hypotheses, we collected the data by scrapping archival documents of interlocal agreements from 2012 to 2018 in the state of Nebraska. This choice majorly hinges on data availability and quality. Longitudinal interlocal collaboration network from the survey of local officials is not widely available; and even worse, this data collection method can entail incomplete network due to non-respondence (Hugg 2020). State of Nebraska is one of some states which publish this information available to the public. According to Nebraska state statute section 15-3, any governing body which is a party to an agreement pursuant to the Interlocal Cooperation Act or the Joint Public Agency Act or is conducting business under a trader name, corporate name or business name, is required to submit such information to the Auditor of Public Accounts annually. Nebraska State Auditor compiles and releases a list of reporting files on the official websites. In the report, it contains not just the participating parties, but also brief description on the purpose and period of the agreement. This information would then enable us to construct unique longitudinal service delivering network data to capture the whole network feature and examine network evolution over time.

Network variables of interest is the number of total collaborators, new and terminated collaborators from t to $t-1$, since we expect leadership turnover would modify the pattern of interlocal collaboration. The first step to get these variables is to construct a bipartite network which shows the relationship between the nodes and events for each year. To our setting, events represent specific interlocal agreements in police services, including law enforcement, interoperable radio communication, 911 services dispatching, jail services and so on. The nodes are county governments signing in each interlocal agreement. Hence, in the network matrices, if the one county government participates in a specific interlocal agreement, the cell of the interaction between the focal county government and the interlocal agreement would be coded as 1; otherwise, be 0. We include the interlocal agreement that at least one county government reports, even though other

participating county governments may not do so.

Next, we then project bipartite networks into weighted and undirected one-mode networks. In this adjacency matrix, each cell represents the frequency of co-signature in the same interlocal agreement by a pair of county governments. Here the network size and types of collaborators, rather than tie strength, are of particular interest, so we dichotomize the network using the threshold that a pair of county governments co-sign at least one interlocal agreement. By summing up each rows of number except for the diagonal element, we then obtain the number of total collaborators for each year. By comparing collaborators between t and $t-1$, we can get the number of new and terminated collaborators from year to year. Network statistics and sociogram can be found in the Appendix (Table B1 and Figure B1)

Measuring organizational performance—crime incidents

To assess the number of crime incidents, we use annual offense incidents, including property, violent and simple assault at the county level. Nebraska Crime Commission collect the information from law enforcement agencies (available from their official website). We expect interlocal collaboration and leadership turnover would reduce annual crime incidents. As mentioned, interlocal collaboration is expected to improve service quality. And leadership turnover may strength interlocal collaboration as we posted before or improve internal management to enhance organizational performance.

Measuring leadership turnover

Leadership turnover are measured by the ratio of county commissioners/ supervisors who failed to be re-elected or leave for some reasons before the term. Among 93 counties in Nebraska, 70 are commissioner form of government with three, five or seven board members and 23 are township form of government with seven members. All members of the governing board are elected to four-year terms, although they may not be elected at the same time. Due to this, there are some variations of turnover ratio for each year within our research time period. We collect this

information from the election summary reported by Nebraska Association of County Officials.

Control Variables

In addition to these main variables, several control variables are collected and included in our model. Specifically, we control for socio-demographic characteristic of each county, including population size, ethnic diversity, population immigration(mobility), median household income, unemployment rate. All these are collected from American Community Survey done by Census bureau. We also consider fiscal condition by measuring the amount of annual total property tax request. The information is obtained from the Basic Budget Data Query of Nebrask Auditor of Public Accounts. Since the personnel resource can influence organization performance, we further include officers coverage, as measured by the number of full-time police officers per 1,000 population. We gather this information from law enforcement employment reports compiled by Nebraska Crime Commission. Descriptive statistics of variables are reported in Table 1.

Table 1: Descriptive Statistics

	Obs.	Mean	SD	Min	Max
Crime number	651	710.78	3193.29	0.00	28429.00
Turnover ratio	651	7.71	14.94	0.00	100.00
Total collaborators	651	18.35	9.44	0.00	44.00
New collaborators	651	1.11	2.71	0.00	20.00
Terminated Collaborators	651	1.02	2.74	0.00	21.00
Population	651	19806.34	63691.70	342.00	546877.00
Median household income	651	49154.21	7031.21	32292.00	79549.00
Unemployment rate	651	3.15	0.75	1.90	8.70
Ethnic diversity index	651	10.30	10.11	0.54	52.72
Officers coverage	651	1.68	0.96	0.00	8.80
Election	651	0.57	0.50	0.00	1.00
Mobility	651	1342.19	4102.07	8.00	32385.00
Property tax	651	6300551.30	13127090.21	427953.00	120208368.00

Empirical Strategy

The analysis proceeded in two parts to respectively examine the mediation and moderation hypotheses. We begin with the relationship between turnover and collaboration, which is the most critical identification of the mediation hypothesis. If turnover have strong association with collab-

oration, we further identify their impacts on organizational performance. The three variables of collaboration: total collaborators, new collaborators and terminated collaborators are count data in distribution, which are highly skewed to zero and over-dispersed (Figure 2). Although visualization of the total collaborators variable is more normalized than the other two, its variance (var = 89.18) is larger than its mean. Therefore, we employed negative binominal regression models to construct our analysis for H1. In addition, we included fixed effects under the panel data structure to rule out time invariant unobservable.

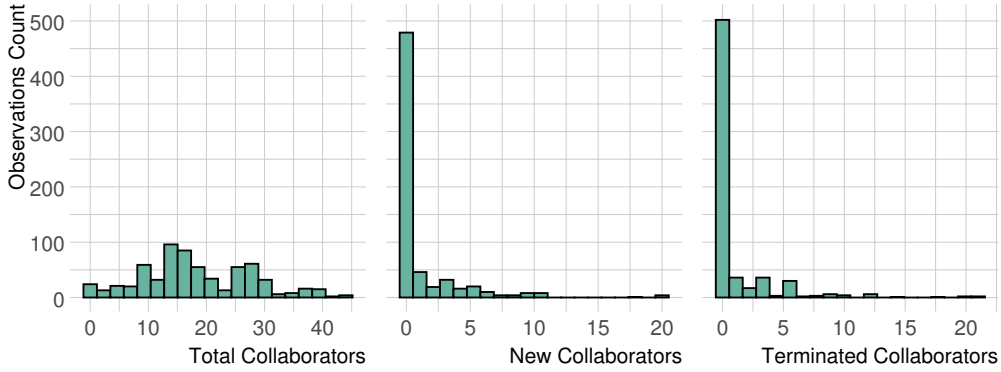


Figure 2: Distribution of Interlocal Collaborators

Comes to the moderation hypothesis, we assume that the organizational performance, county crime, is simultaneously affected by collaboration, turnover ratio and their interaction term. The time series trend of crime data in Nebraska (Figure 3) is short and persistent, which requires dynamic model to address the serial correlation issue. A short time series data (compared to the 93 cross-sectional units) with lagged dependent variable often correlates with the error term, which produce a "Nickell bias" (Claassen 2020). In addition, we assume that turnover and collaboration have contemporaneous effects on performance, so reverse causality should be concerned.

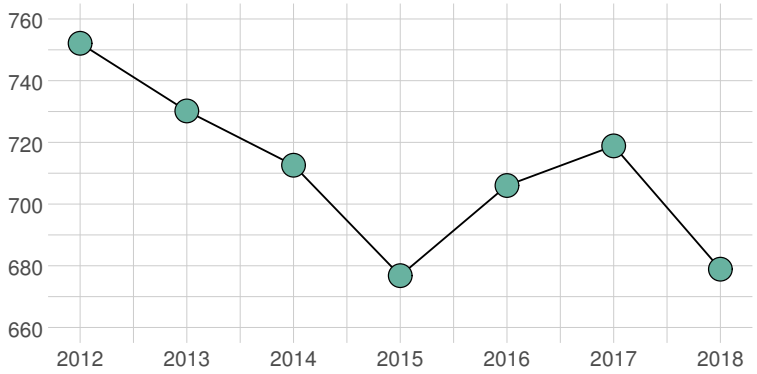


Figure 3: Average County Crime in Time Series Trend

Instrumental variable is the classical tool to address these endogeneity issues, but it is often hard to detect external instruments that strongly correlate with both turnover and collaboration but orthogonal to crime. Therefore, we adopted Blundell and Bond (1998) system generalized method of moments (GMM) to identify causal effects of turnover and collaboration on county crime. System-GMM uses lag dependent variables in both levels and differences as the internal instruments to isolate the causal relations for multiple explanatory variables. In our seven years panel data, we recorded second to sixth lags of crime as the instruments to make our explanatory variables exogenous. In addition, system-GMM also allows us to include the first and second lag of crime in the right-hand side equation, which eliminates the serial correlation problem.

Results

We start with descriptive statistics of our interested and control variables. Our sample contains all 93 Nebraska counties in 7 years, so the total observation is 651. Overall, every Nebraska county has in average 710.78 crimes per year, 7.71 percent elected officials' turnover rate, 18.35 collaborators in public safety service network, and nearly add and terminate 1 collaborator per year. To normalize the distribution of population, medium household income, population immigration (mobility), and government's property tax revenue, we took natural log on these variables. We record the original distributions of these control variables in Appendix A. The main investigation is relationship between turnover, collaboration and organizational performance, so the statistics of

control variables is not interpreted here.

Testing the mediation hypothesis

Turning to our mediation hypothesis, Table 2 reports the effects of turnover on three different measurement of interorganizational collaboration behaviors: *total collaborators, new collaborators and terminated collaborators*. In general, these fixed effects negative binomial models suggest null findings from turnover on either collaboration variable, which reject our mediation hypothesis. Based on the magnitudes and significance tests of turnover variables in the three models, we suggest that turnover have nearly zero impact on interlocal public safety collaboration behaviors.

Table 2: Negative Binomial Estimates of Collaboration Partners

	All Collaborators	New Collaborators	Terminated Collaborators
Turnover ratio	-0.000	0.001	-0.003
	(0.001)	(0.005)	(0.006)
Ln(Population)	-0.209^{**}	-0.376	-0.292
	(0.080)	(0.359)	(0.401)
Ln(Income)	-0.523^{**}	3.055^{**}	2.291^{*}
	(0.188)	(0.939)	(0.998)
Unemployment rate	0.002	-0.103	-0.132
	(0.015)	(0.124)	(0.146)
Diversity	0.025	0.012	-0.007
	(0.015)	(0.021)	(0.018)
Officer coverage	-0.028	-0.098	-0.067
	(0.015)	(0.102)	(0.115)
Election	0.012	-0.479^{**}	-0.516^{**}
	(0.020)	(0.160)	(0.173)
Ln(Mobility)	0.041	0.126	0.007
	(0.048)	(0.286)	(0.317)
Ln(Property tax)	0.153	0.342	0.456
	(0.128)	(0.299)	(0.322)
Constant	23.702	-36.771^{***}	-30.184^{**}
	(334.217)	(9.657)	(10.341)
Fixed effects	Yes	Yes	Yes
Log-Likelihood	-1477.221	-474.119	-419.929
Observations	651	651	651
N counties	93	93	93

*p $<$ .05; **p $<$ .01; ***p $<$ .001

Testing the moderation hypothesis

Table 3 and 4 are our system-GMM estimators of annual crime incidents at the county level. First, we combined each collaborator variable with turnover ratio to predict crime as baseline models in Table 3. Then, we add their interaction terms in Table 4 as our key variables to examine the moderation hypothesis.

Table 3: System-GMM Estimates of Organizational Performance

	GMM 1	GMM 2	GMM 3
Crime_{t-1}	0.670^{***}	0.671^{***}	0.673^{***}
	(0.017)	(0.019)	(0.016)
Crime_{t-2}	0.320^{***}	0.320^{***}	0.318^{***}
	(0.016)	(0.018)	(0.015)
Turnover ratio	-3.240^{***}	-3.416^{***}	-3.097^{***}
	(0.804)	(0.893)	(0.857)
Total collaborators	-1.534^{**}		
	(0.522)		
New collaborators		-6.845	
		(4.956)	
Terminated collaborators			-1.408
			(2.789)
Ln(Population)	4.135	-0.598	6.573
	(10.059)	(13.966)	(8.695)
Ln(Income)	19.737^{*}	32.129^{**}	22.726^{**}
	(8.030)	(10.702)	(7.376)
Unemployment rate	-2.491	-1.650	-2.069
	(3.649)	(4.475)	(3.531)
Diversity	0.369	0.726	0.590
	(0.552)	(0.677)	(0.671)
Officer coverage	-8.513^{*}	-8.861^{*}	-9.009^{*}
	(3.423)	(4.374)	(3.952)
Election	-25.343	-25.204	-24.250
	(13.017)	(14.309)	(13.517)
Ln(Mobility)	2.642	6.231	1.430
	(8.399)	(11.480)	(7.453)
Ln(Property tax)	-12.273	-21.439^{**}	-17.382^{**}
	(7.078)	(7.073)	(6.145)
Observations	651	651	651
N counties	93	93	93
N instruments	39	39	39
Hansen test (p-value)	0.450	0.469	0.328
Arellano-Bond AR(2) test (p-value)	0.261	0.358	0.223

Note 1: Windmeijer correction standard errors are in brackets.
Note 2: *p $<$ .05; **p $<$ .01; ***p $<$ .001

Our baseline models suggest that turnover have consistent negative effects on crime. Control-

ling the total size of collaboration party in GMM1, one percent increase in turnover ratio causes crime number decreases in 3.24 (p = 0.00). Similar effects also happen when we combine the turnover ratio with the number of new or terminated collaborators in GMM2 and GMM3. GMM1 also shows that number of total collaborators increase by one unit, the county annual crime number decreases 1.53 (p = 0.00). However, neither adding new collaborators nor terminating existing collaborators affects crime number. These baseline evidences suggest that both turnover and collaboration improve Nebraska counties public safety performance.

Next, we look at our moderating effect models in Table 4. These models repeatedly show that turnover ratio increase results county crime decrease. When adding interaction terms, the effects from collaboration variables become more salient. GMM4 presents that one collaborator increase leads to crime decrease in 6.10 ($p = 0.00$). Likewise, adding one new collaborator contributes in 11.46 (p = 0.02) crime decrease (GMM5). Consistent with GMM3, terminating existing collaborators and its interaction with turnover ratio have null effect on crime in GMM6. The more interesting findings are from the interaction terms of turnover with total and new collaborators. In GMM4, if turnover ratio increases with a larger size of collaborator network, crime number will accordingly increase. Although the magnitude of this interaction is small (coefficient = 0.656), its significance signal is strong ($p = 0.00$). Similar backfire also happens in GMM5 when turnover ratio increases with larger size of new collaborators (coefficient = 1.45; $p = 0.02$).

In summary, these evidences support our moderation hypothesis. When newly elected officials face a large size of existing interlocal collaboration network, they do not have enough capacity and social capital resource to handle it. Eventually, organization performance is counterproductive. With the same logic, adding too many new collaborators immediately after the newly elected officials run the office is also not an effective strategy to improve organizational performance. Too much uncertainty and unfamiliarity lead to administrative failure. Overall, executive turnover and interlocal collaboration both have positive effects on public safety performance, but their interactions result backfire.

Table 4: System-GMM Estimates of Organizational Performance (Interaction)

	GMM 4	GMM 5	GMM 6
Crime$_{t-1}$	0.667^{***}	0.658^{***}	0.673^{***}
	(0.020)	(0.016)	(0.016)
Crime$_{t-2}$	0.319^{***}	0.332^{***}	0.318^{***}
	(0.020)	(0.015)	(0.015)
Turnover ratio	-14.703^{**}	-4.443^{***}	-2.847^{*}
	(4.629)	(1.285)	(1.147)
Total collaborators	-6.104^{**}		
	(1.921)		
New collaborators		-11.456^{*}	
		(5.153)	
Terminated collaborators			-1.729
			(3.650)
Turnover ratio×total collaborators	0.656^{**}		
	(0.206)		
Turnover ratio×new collaborators		1.448^{*}	
		(0.617)	
Turnover ratio×terminated collaborators			0.049
			(0.468)
Ln(Population)	11.091	5.237	7.381
	(19.573)	(12.222)	(8.902)
Ln(Income)	25.628	16.697	23.566^{***}
	(17.279)	(9.455)	(6.923)
Unemployment rate	-8.715	1.211	-1.588
	(7.537)	(5.304)	(3.526)
Diversity	0.324	0.602	0.498
	(0.592)	(0.617)	(0.620)
Officer coverage	-7.936	-11.088^{**}	-8.859^{*}
	(6.265)	(4.200)	(3.700)
Election	-9.674	-28.100	-25.437
	(28.611)	(16.151)	(14.016)
Ln(Mobility)	3.368	-0.329	0.621
	(13.158)	(9.975)	(7.223)
Ln(Property tax)	-14.243	-11.463	-18.301^{***}
	(17.228)	(6.772)	(5.318)
Observations	651	651	651
N counties	93	93	93
N instruments	39	39	39
Hansen test (p-value)	0.939	0.588	0.528
Arellano-Bond AR(2) test (p-value)	0.313	0.185	0.207

Note 1: Windmeijer correction standard errors are in brackets.
Note 2: *p $<$ .05; **p $<$ .01; ***p $<$ .001

Robustness

We conducted several robustness checks for model specifications in both hypotheses testing. First, we concerned the potential contemporaneous reverse causality in our negative binomial col-

laboration prediction models. The association between turnover and collaboration can be the other way around, that is, the collaboration network structure change leads to turnover event happen. To adjust this issue, we consider the possible lag effect from turnover to collaboration, which is, newly elected officials need enough time to gain network knowledges and purpose collaboration plans. So, we did a robustness check using turnover ratio in the $t-1$ year to predict the three collaboration variables (Appendix B). However, the null findings are consistent with our main results in Table 2. Therefore, we suggest that newly elected officials have not modified the existing interlocal collaborators to improve county crime performance in their elected year or in the near future. Collaboration cannot be interpretated as a mediator to affect turnover-performance relationship in theory and practice.

For our moderation hypothesis, we conduct two standard tests for the system-GMM models: Hansen test for instrument validity and Arellano-Bond autocorrelation test: AR(2) for serial correlation. The Hansen test diagnoses the strict exogeneity assumption for GMM instruments (Roodman 2009). If the p-value of Hansen test lower than the significance threshold level, the null hypothesis of instrumental exogeneity would be rejected, which indicates that at least some of the instruments are endogenous with the dependent variable. In fact, all six models in Table 3 and 4 have Hansen test p-value larger than 0.1, which failed to reject the null hypothesis. Our GMM instruments are jointly valid for each model. AR(2) captures the second-order serial correlation in the first difference residuals (Arellano and Bond 1991). Test results indicate that none of our models' AR(2) p-values is lower than the 0.1 significance threshold. Therefore, we have less concerns about serial correlation bias. Overall, the above tests indicate the robustness of our analysis and convince our findings.

Conclusion

The empirical analysis reported here provide supportive evidence on the moderating effect of interlocal collaboration on the turnover-performance relationship, although both mediation and moderation hypothesis can both be true in theory. Specifically, leadership turnover can push or-

ganizational performance downward, when the focal organization has built several interlocal collaboration prior to turnover events. Due to the interdependency derived from the nature of policy problem and past interactions, new leaders cannot easily redesign the institutional arrangement of services delivery, at least in the field of police services, even though institutional reform may be required for performance improvement. On the other hand, the erosion of collaborative management capacities resulting from leadership instability can then further worsen organizational performance.

This study underscores interlocal collaboration matters for organizational outcomes produced by leadership turnover. As shown in our results, while leadership turnover itself in general improve organizational performance, its impacts could be detrimental especially when local governments are already deeply embedded in interlocal collaboration. The results are consonant with the conventional wisdom about talent drain(Becker 1962; Moynihan and Landuyt 2008; Shaw et al. 2005). More importantly, the findings also suggest the importance of new leaders' discretion on carrying out institutional reform. When making change in interlocal collaboration is not a viable option for new leaders, the focal organization may not benefit from the infusion of new ideas and interorganizational relationship transferred by new leaders, as suggested by recent studies (Yi and Chen 2019; Yi et al. 2018). In contrast, the organization would need to pay extra expense for recruiting new leaders who may need some time to acquire tacit knowledge in order to make internal and external working relationship function as expected. And it seems that the degradation of organizational performance could be one part of such expense. In brief, this study demonstrates turnover context matters. And examine interlocal collaboration as the third variable affecting the relationship between turnover and organizational performance has provided fruitful insights as demonstrated here. We would encourage more works to be done to explore other mechanisms and conditions under which leadership turnover affect organizational performance.

By collecting the unique longitudinal data of interlocal collaboration in the state of Nebraska, we are able to illustrate the complicated relationship between leadership turnover, interlocal collaboration and their impacts on organizational performance. While there is an increasing interest in the analysis of the adoption of interlocal collaboration, few studies give sufficient attention to

its effectiveness. This can in part be explained by data limitation. As mentioned before, prior studies tend to use cross-sectional survey data to capture the pattern of interlocal collaboration. And such data collection method may not be an appropriate approach to evaluation the influence of interlocal collaboration on organizational performance, in part because of incomplete information on collaboration patterns and the problem of endogeneity. By constructing the interlocal collaboration network from archival data over seven years, we are then more capable to address these issues. Hence, this study is one of few studies examine the effects of interlocal collaboration. Also, we take one step further to investigate the potential mediating and moderating effect of interlocal collaboration, advancing our knowledge on the role of interlocal collaboration in municipal governance. Although the empirical data are drawing from one state only, we expect our theoretical argument can be applicable to a more general context. Hence, we are looking forward more empirical testing to be done in other states and seeing whether similar results could be replicated.

Finally, this study shed some light on the dark side of interlocal collaboration. While interlocal collaboration could help local governments address complex issues and rectify the diseconomies of scale, interdependency deepened by frequent interactions could lock the participating parties into certain patterns, as Elston et al. (2018) argued. Here, we show that such path dependency may not be resilient to internal turmoil, such as leadership change in one party of the collaborative relationship. Of course, our finding may be confined to the case of sharing police services in which alternative partners are limited. Future studies on other types of sharing service delivery and collaboration scenario are warranted.

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Appendix A: Variable Distribution

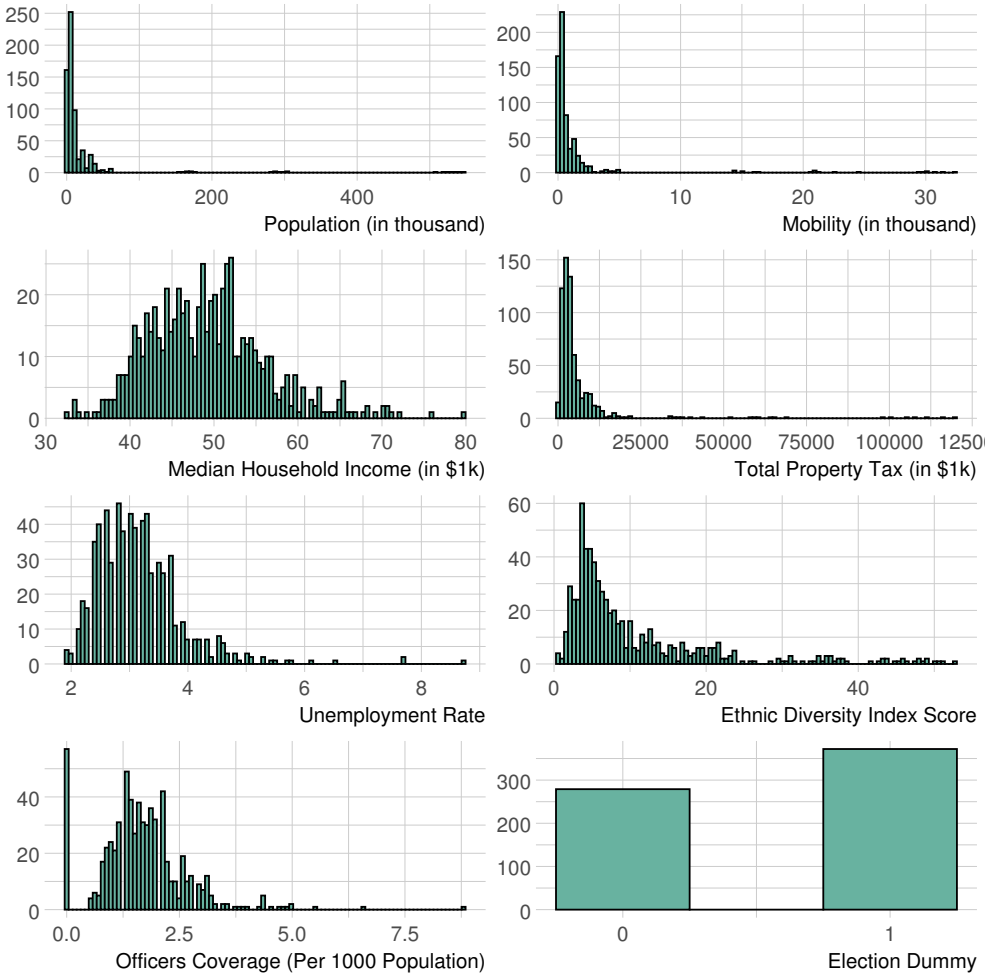


Figure A1: Distribution of Covariates (Vertical Axis: Observation Count)

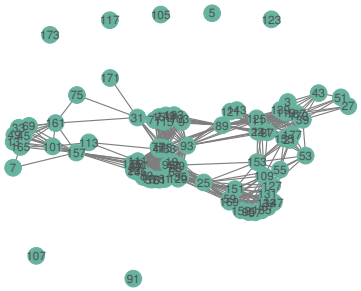
Appendix B: Interlocal collaboration Network

Table B1: Network Statistics of Nebraska Inter-local collaboration (2012-2018)

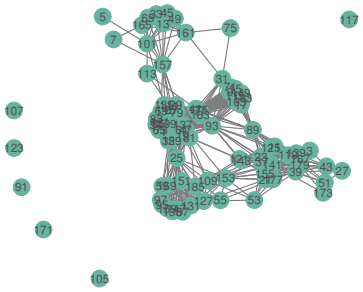
	Whole Network				Public Safety Network			
Years	Nodes	Edges	Density	Diameter	Nodes	Edges	Density	Diameter
2012	93	524	0.12	6	88	286	0.07	Inf
2013	93	1349	0.32	5	86	418	0.10	Inf
2014	93	531	0.12	5	87	287	0.07	Inf
2015	93	1788	0.42	5	90	542	0.13	Inf
2016	93	627	0.15	5	90	327	0.08	Inf
2017	93	1758	0.41	5	93	544	0.13	8
2018	93	588	0.14	5	93	326	0.08	8

Note: Diameter becomes infinite because there are isolators in the network.

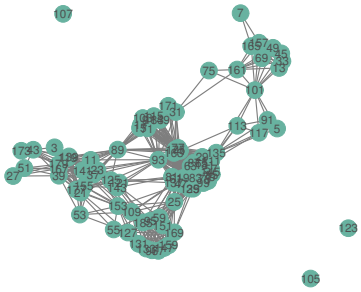
(a) 2012



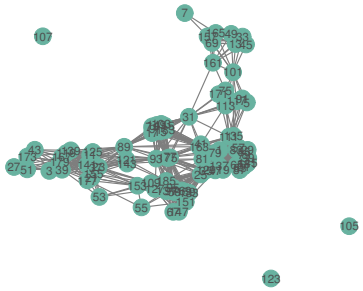
(b) 2013



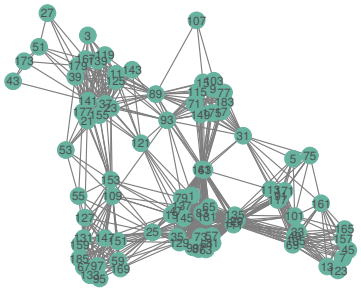
(c) 2014



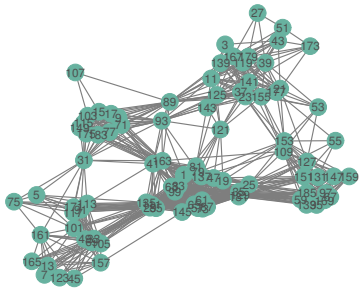
(d) 2015



(e) 2016



(f) 2017



(g) 2018

Figure B1: Nebraska Inter-local Agreements in Police Services from 2012-2018

Appendix C: Using Turnover in $t-1$ Year as Independent Variable

Table C1: Negative Binomial Estimates of Collaboration Partners

	All Collaborators	New Collaborators	Terminated Collaborators
Turnover ratio$_{t-1}$	0.000	−0.000	−0.004
	(0.001)	(0.005)	(0.006)
Ln(Population)	−0.204*	−0.381	−0.323
	(0.080)	(0.361)	(0.407)
Ln(Income)	−0.515**	3.062**	2.212*
	(0.189)	(0.939)	(1.007)
Unemployment rate	0.001	−0.102	−0.125
	(0.015)	(0.125)	(0.148)
Diversity	0.026	0.012	−0.007
	(0.015)	(0.021)	(0.018)
Officer coverage	−0.027	−0.098	−0.074
	(0.015)	(0.102)	(0.115)
Election	0.008	−0.488**	−0.447*
	(0.021)	(0.165)	(0.178)
Ln(Mobility)	0.039	0.129	0.028
	(0.048)	(0.286)	(0.321)
Ln(Property tax)	0.154	0.344	0.465
	(0.127)	(0.299)	(0.325)
Constant	23.055	−36.845***	−29.366**
	(274.723)	(9.652)	(10.406)
Fixed effects	Yes	Yes	Yes
Log-Likelihood	-1477.065	-474.143	-419.858
Observations	651	651	651
N counties	93	93	93

*p $<$ .05; **p $<$ .01; ***p $<$ .001