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Competition in Collaborative Networks?

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This is just a DRAFT.

All Comments are appreciated.

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Abstract: This paper provides a framework for the study of a whole network. I review and operationalize network level variables that may impact the outputs from a network. The author asks do structural relationships of a network impact the works of the network?

A pervasive new form of governance is burgeoning in practice in the public sector – networks. Networks are an increasingly common way public sector organizations can come together to achieve a purpose (Goldsmith and Eggers, 2004). While networks have become more common in the practice, academics have also become keen to study these new organizational forms. However while research has accrued on networks rapidly, a great deal of it has been descriptive in nature (Provan et. al., 2007). Descriptive networks research has aided academic understanding of what networks are as well as the purpose for which networks are instituted. However, only few empirical findings have demonstrated the relationship between networks and what it is done in the public sector. That is, what impact does the network have itself? Provan et. al. (2007) define this as *whole networks* research. The purpose of researching whole networks is to understand the impact of *network level factors* on the work of the network. This research carefully studies one network for the purpose of understanding the impact of *network level factors* on the work of networks.

Why Networks?

Networks can simply be described as: “a more or less stable pattern of social relations between mutual dependent actors, which form around a policy, program, and/ or cluster of means and which are formed, maintained and changed through series of games” (Koopenjan and Klijn, 2004, pp. 69-70). Networks emerge as a way to structure relations between multiple organizations that is different that hierarchy. Ostrom and Ostrom (1971) argue that “the best structures for satisfying individual preferences are not centralized bureaucratic agencies, but rather more fragmented, multi-organizational arrangements” (in Denhardt and Denhardt, 2009 p. 175). Similarly the “New Public Administration”

movement heralded the importance of inclusive strategies for governing (Denhardt and Denhardt, 2009). Such movements laid the groundwork of the increasing demands for networked government. However, the increase in networks while receiving considerable academic attentions, has still yet to overwhelming study the impact networks have on what is done.

Whole Networks

The disconnect between assumptions made about networks and empirical evidence demonstrating the positive impacts of networks, Provan et. al. (2007) explain, is a lack of research at the network level of analysis. Provan et al. (2007) suggest most of the research on networks has focused on the properties of networks. For instance, “what networks are, how they are structured, how they operate, and even how they develop” (p. 480). For example, Arganoff and McGuire (2003) have shown differences between networks and hierarchies exist. Also, the skills public managers need to operate in networks differ from those in hierarchies (McGuire, 2002). Despite this important research area and the increasing information that is being generated, Provan et. al. (2007) argue there is an aspect of networks that has been understudied, what they call “*whole networks*.”

Whole networks research focuses on “inter-organizational networks at the network level, rather than the organizational level of analysis” (Provan et. al., 2007, p. 480). Provan et. al. (2007) provides a specific definition of whole networks: “a group of three or more organizations connected in ways that facilitate achievement of a common goal...formally established and governed and goal directed rather than occurring serendipitously.” (p.

482). The authors go on to describe the relationships that exist among organizations in a whole network as:

...primarily nonhierarchical, and participants often have substantial operating autonomy. Network members can be linked by many types of connections and flows such as information, materials financial resources, service and social support. Connections may be informal and totally trust based or more formalized, as through contract (p. 483).

The critical attribute of whole networks for study is structure and process. Again this is differentiated from past network research that focuses on organizations that compose a network.

By studying whole networks or the structure and process of inter-organizational relationships the author can learn a great deal about outputs and outcomes from a network (Provan et. al.,2007). McGuire (2006) explains, "Growing concerns for determining the strength and influence of collaborative management [exits] instead of simply documenting it" (p. 40). This research addresses McGuire (2006) call. The purpose of the dissertation is to study network level factors that may impact the work of the network itself. Improved understanding of the impact network level factors has on the work of a network will help to either prove or disprove common assumptions about networks that are currently prevalent in the literature.

Network Theory

Koopenjan and Klin (2004) explain "a high density and a variety of organizational networks characterize society" (p. 3). The authors go on to explain organizational networks are *horizontal relationships* (as compared to hierarchies) between organizations formed on the premise of *mutual dependency*. Other definitions of organizational networks abound. Goldsmith and Eggers(2004) using the term "joined up government" explain networks as:

“the joining up of various levels and agencies of government to provide more *integrated* services” (p 15). O’Toole (1997) describes networks as “structures of *interdependence* involving multiple organizations or parts thereof, where *one unit is not merely the formal subordinate of the other in some larger hierarchical arrangement* (p. 47).

Based on these definitions the critical attributes of a network that differentiate it from some other organizational paradigm are: (1) vertical differentiation and (2) organizational dependence, the need to work together. Therefore, network theory is concerned with how individuals or organizations that have a need to work together organize without hierarchy. Normatively, network theory holds that if the conditions of non hierarchy and interdependence exist then the production function of the network is comparatively improved than the production function of an individual or organization alone. However, not all networks are the same. Networks do not arise for the same reasons. The level of interdependence and vertical differentiation can vary dramatically. Therefore, network theory is concerned with explaining how vertical differentiation and interdependence exist in networks and what impact they may have.

Networks, therefore, are essentially a theory of structural relationships predicated upon governance. Governance used this way means: “mechanisms for *formal coordination*” (Provan and Kenis, 2007, p.230). Just as public administrators have long argued studying the public sector is different than studying the private sector. Network theorists suggest studying a network differs than studying a hierarchical organization, but similarities exist, as well. Knoke (1990) explains: “The basic units of any complex political system are not individuals, but the positions or roles occupied by social actors and the relationships or

connections between these positions” (p.7).O’Toole (1997) explains networks are more than the sum of nodes and links; they are forms of social organization, interesting in their own right. Networks from this perspective are concerned with how lines between organizations are first blurred (descriptive) and then how the blurred lines constitute a form of relationship that can have an impact upon what is done (whole networks). This is similar to the structural perspective in organizational theory.

Structure in Networks

Network literature is premised on the importance of structure (Knoke, 1990). Structural assessments of organization are steeped in the history of organizational theory beginning with Max Weber’s ideal bureaucracy. Bowman and Deal (1997) define structure as “a blueprint for the patten of expectations and exchanges among internal players (executives, managers and employees) and external constituencies (such as customers and clients)...Structural form both enhances and constrains what organizations can accomplish (p.38-39). They go on to define two classes of structure: vertical coordination and horizontal coordination. Structural assessments of organizations usually focus on the impact of these two classes of structure to outputs. Structural assessments of public and private sector organizations have amassed enormous generation of knowledge (Scott, 1995).

Structure in network analysis is not altogether different. Network analysts seek to understand the structure of the network. Structure is defined as the study of “patterns of particular ties between actions, where variation in the network in the existence of strength of ties is meaningful and consequential” (Cook and Whitmeyer, 1992, p. 118). Cool and

Whitmeyer relate network theory to the “Structralist” position in Sociology, stating: “that all important social phenomena can be explained primarily, if not completely by social structure” (Cook and Whitmeyer, 1992, 110). How organizations in a network are structured will have impact upon the work that is done by the network.

Organizations in a network are not operating alone; instead they are operating in relationship to other organizations. But while networks have claimed to be non hierarchical, the social and political sciences have long demonstrated that structural relationships create an uneven distribution of power. This finding has been adopted among network theorists as well. O’Toole and Meier (2004) write “...political dynamic does not disappear when agencies operate in a networked contexts; it is likely they are exacerbated” (p. 690). Hannerman and Riddle (2005), explain how network analysis has come to incorporate the idea of power, or political relationships into analysis, he states:

the network approach emphasizes that power is inherently relational. An individual does not have power in the abstract, they have power because they can dominate others -- ...Because power is a consequence of patterns of relations, the amount of power in social structures can vary
(http://www.faculty.ucr.edu/~hanneman/nettext/C10_Centrality.html)

Marsden (1981) similarly describes power in relational terms, focusing on the constraints and possibilities created by a network structure. The structure of the relationships between organizations (or actors) will affect the actions that are taken. Therefore while, non-hierarchy exists in a network, other structural relationships, in a network, will create imbalances of power as well. Students of network analysis seek to identify and measure variance between organizations as they relate to the network as a whole. Centrality is a network level factor that measures relational variance from the structralist perspective.

Centrality

Knoke (1990) explains, “the most central positions in a network are those involving many reciprocated ties to other actors” (p. 10). Like the top of a hierarchy in a traditional organization, network centrality of an organization in a network may confer power. Centrality is based on a formula that reflects the density of an organization. *Density* is a measure for the number of ties between nodes (organization) in a network (Hannerman and Riddle, 2005). Density is the ratio between numbers of ties that exist over the number of total possible ties. Centrality, then, reflects the variance in ties each organization or node in a network has. However, centrality as a concept can also be expanded to include information beyond mere number of ties. Centrality can also explain power advantages and disadvantages in a network that can be represented by giving specific value to the equation for centrality in an organization. For instance, Cooke and Whitmeyer (1992) define centrality as “network position –conferred advantage” (p. 120).

Tolbert and Hall (2009) suggest centralization is key dimension of structure in organizational research. They suggest authors have defined the concept many ways but “...fundamentally...the concept of centralization refers to the degree to which decision – making responsibility and power in an organization are closely held by a few elites, or widely distributed among different organizational members (Tolbert and Hall, 2009, p.37).

Tolbert and Hall (2009) summarize the impact of centralization in much of the inter-organizational research has having two key advantages, “greater coordination and faster decision making.” Intergovernmental relations literature has demonstrated compliance is an outcome from centralization. For instance, Weber (1998) finds a

relationship between legal compliance and network centrality; more rigid structure and process led to closer identification of the group with the rules that governed the policy area in which they were working. Ibarra (1993) finds centrality to be a pivotal dimension in understanding innovation. Borgatti and Everett (1992) in a review of network literature mention several other studies in which centralization in a system is identified as important.

However, centrality is not always seen as a positive advantage. Freeman (1979) purported that an organization with a high number of ties, greater centralization, may in fact incur greater costs. Etzioni (1975) suggests coercion from the top can alienate involvement of others and enable the creation of moral involvement (Tolbert and Hall, 2009). Research developed from Etzioni's perspective has found: when members are encouraged to participate and actually do participate, they become morally involved (Tolbert and Hall, 2009). Apparently, the failure to include multiple stakeholder impacts the effectiveness of the organization. Decentralization as Provan and Kenis (2007) suggest may make for a more inclusive network in which outputs better represent the will of all organizations involved.

For this reason, network analysts have come to measure centrality numerous ways, using both different measures of the concept as well as operationalizing centrality different in order to give value and or meaning to centrality in a network.

Core Agency Centrality

One meaning or value that has been applied to the measure of centrality is that of "core agency centrality" or the existence of a lead organization. A lead organization coordinates "all major network –level activities and key decisions" (Provan and Kenis,

2007, p.235). The lead organization provides “administration for network and or facilitates the activities of members organization in their efforts to achieve network goals” (p. 235) The lead organization may “underwrite the cost of network administration on its own, receive resources contribution from network member or seek and control access to external funding through grants or government funding” (p. 235). The authors go on to suggest that in this role, often the lead organization has leverage in sharing and recruiting network members to share their goals. Provan and Milward (1994) find that a lead organization (or what they call core agency centrality) can serve to better integrate and coordinate multiple organizations in a network. They state: “centralization appears to facilitate both integration and coordination, something that decentralized systems have a difficult time accomplishing because of the number of organizations and linkages involved” (Provan and Milward 1995, 24). Provan and Milward (2002) find when a core central agency exists effective collaboration is made much easier. The authors’ analysis demonstrates that “when influence over mental health decision was highly concentrated in a single core agency...client outcomes were highest...when influence was highly dispersed among a number of agencies... effectiveness was lowest” (p. 16). McGuire (2006) explains, “Instead of a completely flat, self-organizing network, the presence of a lead organization, acting as system controller or facilitator, is often a critical element of effectiveness in collaborative management.” (p. 36). Similarly, Arganoff and McGuire (2003) testing hypothesis in local economic development networks find, lead organizations, with a diverse board of governors’ leads to more effective collaboration.

My review of centrality suggests three things: (1) centrality can be measured and operationalized different ways; (2) centrality can be a positive and negative to an

individual organization in a network and (3) a central organization in a network can have positive impacts on the work of the network itself. These findings are considered in my analysis of a single network. Most importantly, centrality is an important concept to network analysis. Careful attention must be paid when operationalizing and choosing a measure of centrality and finally, centrality in a network should be explanatory of what a network does.

Control of Resources

Another common way to operationalize centrality in a network is control of resources. This view emerges from the theory of resourced dependency first promulgated by Pfeffer and Salancik (1978). Similar to what network theorists hold today, Pfeffer and Salancik (1978) argued that organizations are interdependent; not self-sustaining, they rely on other organizations. This assumption is similar to network theorists' assumption of organizational interdependency. The condition of interdependency causes organizations to seek to manage their control of resources. That is, when organizations are working together they will try to insure a stable flow of resources to continue their own autonomous operation. Therefore, organizations in a network that can maintain a stable flow of critical resources will gain a central position in the organization. Much of resource dependencies core assumptions have been incorporated into network theory. Networks scholar often measure the collaboration of networks, through the flow of financial resources (Gulati, 2001).

Hierarchy

Another dimension of centrality that can exist in a network is *hierarchy*. Hierarchy in a network is slightly different than hierarchy in a traditional organization or bureaucratic analyses. Hierarchy is based on the scalar principal. The scalar principal holds that authority should be held at the top of an organization and responsibility should flow vertically from the top of the organization (Starling, 2008). A critical component of hierarchy is authority, the inherent right of someone in a managerial role in the organization to tell others what to do, and coordinate their activities (Starling, 2008). Hierarchy in a network is similar in that some networks will grant authority to certain organizations in a network. Hierarchy is dissimilar in a network because no actual vertical differentiation or practice of the scalar principal exists.

Hierarchy in a network is concerned with how organizations in a network have both differentiated and ranked roles. That is not only do some organization have more ties than others (centrality) or a specific central purpose (lead organization) but their role within in the network can also have a rank (hierarchy). Hierarchy exists when some organization in a network has a legitimized or authoritative rank in the network. Their advantage is not based on ties but on a value given to the organization itself. Hierarchy in this way is related to both centrality as a conferred advantage and the existence of sub-groups within a network.

Empirical findings regarding hierarchy in networks are mixed. Arganoff (2007) in a finds networks with hierarchy may find it difficult to get cooperation from all parties. In a study of a network of virtual organizations hierarchy was pervasive, in contrast to what

was expected. Hierarchy also seemed to impact perceptions of the network itself. The authors explain perceived performance as compared to objective performance was increased when hierarchy existed. That is, while networks may be a more common way to structure, individuals seem to still rely on the institution of hierarchy as a way of conferring information and maintaining legitimacy (Ahuja and Carley, 1998). Moynihan (2005) finds networks in emergency management that have some level of hierarchy can be effective.

The review of hierarchy in literature shows, that while the classical model of organizations has demonstrated the value of hierarchy, hierarchy does have consequences, including buy in from participants, which is important in a network. The existence of hierarchy in a network is expected to have an impact on the work of the network itself.

Goal Congruence

Another structural relationship that this dissertation seeks to explore is goal congruence. Are the goals of organizations in relation to other organizations in the network similar or dissimilar? Goldsmith and Eggers (2004) claim goal congruence is one of the challenges of networks. They explain, "Achieving goal congruence in the public sector is not so simple" (p. 40). While networks may form for a purpose, multiple organizations may view the purpose and the actions needed to serve that purpose very differently. Public sector organizations already commonly suffer from goal incongruence and or goal ambiguity, having multiple public organizations only exacerbate this challenge. Goldsmith and Eggers (2004) state:

Government networks...tend to form to deliver they type of service whose outcomes are sometime unclear, are difficult to measure and may take years to realize To

complicate matters, networks often bring together actors whose goal simultaneously overlap and differ (p 40-41).

The difficulty of achieving goal congruence in networks was easily summarized by Cyert and March (1963) who state: “people (i.e. individuals) have goals; collectives of people do not” (p. 26). More recently, McGuire (2006) asked the question “how networked” (p.36)? Essentially he is questioning how collaborative organizations in a network really are. McGuire (2006) purports goal congruence as measure of the collaborativeness of networks.

Goal congruence as an organization level variable in private sector and public sector literature is often discussed and measured. Provan and Kenis (2007) suggest Perrow (1961) and Ven de Ven (1976) laid groundwork for considering goal congruence (what they call goal consensus) as significant factor in better performance, in spite of conflict. However, they suggest network literature has had a slightly different focus when it comes to the study of goal congruence in networks.

In a seminal study by Bougouis (1980), he hypothesizes a relationship between goal congruence, among top managers in private organizations, and high performance. Disagreement about goals was hypothesized to cause low performance. Data supported the hypotheses: Higher performance existed among the organizations in which managers agreed about goals. Building on these finding other authors have demonstrated similar relationships between goal congruence and performance in the private sector (See: Schwenk and Cossier, 1993). The relations between goal congruence and the outputs of the organization (as assessed in this dissertation) were examined by Shamely and Cora (1992) in a study of private organizations. The authors find when goals are similarly viewed

within an organization there is an impact on what is done in the organization. That is by clearly limiting the goals of an organization the outputs more clearly reflect those goals.

The value of goal congruence in the public sector has also been often evaluated. For instance, Fernandez and Rainey (2006) purport the importance of clear, shared goals to organizational change in the public sector. In a study of public schools, goal congruence between teachers and teachers and administration were tested. The authors hypothesized goal congruence both vertically and horizontally would be positively associated with job satisfaction. Their findings were supported by the data (Vancouver and Schmitt, 2006).

More related to network analysis are the findings of O'Toole (2003) who suggests goal congruence is an important antecedent to cooperative behavior when multiple organization are charged with the implementation of a public policy. Schmidt and Kochan (1977) positively associate goal compatibility with cooperation in a study of local offices of the US Training and Employment Service. In a study of joint ventures (a type of network structure) made by private firms in Japan, Beamish and Delios (in Beamish and Killing, 1997) find joint ventures in which goal congruence among the organizations were more highly appraised than those in which the organization did not have the same goals. Goldsmith and Eggers (2004) allude to issues of goal congruence in the implementation network for the HUD HOPE IV. They claim goal incongruence has inhibited overall effectiveness. Network scholars Provan and Kenis (2007) also suggest the importance of goal consensus. But their works is conceptual; measuring goal consensus in a network eludes them. What they do however suggest is that goal consensus can both be a positive and negative attribute of a network. They explain:

Consistent with early work by Van de Ven (1976) on domain similarity, when there is general consensus on broad network level goals, both regarding goal content and process, and in the absence of hierarchy, network participants are more likely to be involved and committed to the network and more likely to work together. This does not necessarily mean that the goals of network members must be similar. In fact, similarity of purpose can result in difficulties in working together, especially when competitive pressures make network organization reluctant to cooperate and share information (Park 1996) (Provan and Kenis, 2007, p. 239).

They go on to suggest that while goal congruence is important structural aspect of a network, negative aspects of goal congruence can be managed or governed through other structural arrangements.

In this study goal congruence is assessed for the purpose of understanding both if goal congruence exists in a network as well as how goal congruence impacts what is done. Goal congruence based on the literature has both negative and positive consequences for what is done in the network. Mostly, I focus on the positive impact of goal congruence expecting higher goal congruence to be associated with outputs that are similar to the purpose of the network itself. However, the next network level factors, competition helps to better understand some of the negative consequences of goal congruence.

Competition

Organizations don't always collaborate; often they compete, even when their goals are the same as other organizations. Axelrod (1997) stated there is great complexity to cooperation. Much of that complexity is due to competition that occurs in the process of collaborating. He says: "expansion of the potential forms of collaboration implies the expansion of the potential forms of competition" (xiii). Similarly, Goldsmith and Eggers (2004) explain: "goal incongruence also occurs when government activates a network but also competes against parts of the network" (p. 42) Competition, it appears is intrinsic to

collaboration and is therefore likely to emerge in networks. Katz (1964) explained often when two units have similar or overlapping functions they will begin to compete. Wright (1988), an inter-governmental relations scholar, offers a model of inter-governmental relations called the overlapping authority model. He explains: substantial areas of authority are vested among the vertical dimensions of the American federal system. Differentiation in the autonomy of agencies and the power and influence of individuals within the system all exist. Competition is one result of overlapping authority.

Research on local governments has identified similar relationships. Feiock's (2004) collection of empirical articles in *Metropolitan Governance: Conflict, Competition and Cooperation* demonstrate that while cooperation between local governments is becoming common, competition among local governments also exists. Local economic development policy is shown to be a substantive policy arena that requires collaboration but often fosters an environment of competition. Arganoff's (2006) study of 14 networks, he found conflicts over:

...Agency- turf, the contribution of resources, staff time devoted, to the network, the location of meetings and conferences, and most importantly threats of withdrawal because of frustration over the time and effort expended to achieve results (p. 61).

He states when conflicts exist special attention must be paid to the design of the agency to insure competition (zero-sum losses) is not created.

Like goal congruence, competition among the organizations of a network can impact organizational relations with other networks, or the structure of the network. Interestingly, the normative qualifications for networks do not suggest the existence of competition. However, as just explained competition is intrinsic to collaboration. Therefore assessing

competition in networks while rarely done has often been alluded too. Bazzoli et. al. (1998) demonstrates variation in the collaborativeness of networks exists. Similarly, Freid et al. (1998) demonstrate contextual factors of networks, other than collaborative effort can impact network behavior and network outputs. More specifically, competition in a network can significantly limit its productivity (Arganoff, 2007).

Competition as a network level factor is expected to exist as well as impact what is done by the network. Competition is expected to an extent to have positive benefits but too much competition can result in the failure of the network to do what it intends to do.

Review

Centrality and its several operationlizations (core agency and control of resources), hierarchy, goal congruence and competition are the network level variables that this dissertation will use to explain what a network does. They are all founded in a theory of networks. Network theory is based on structural relationships; how organizations relate to each other or how their relations are structured will impact what is done. These variables assess concepts that will impact how organizations relate to each other. There is one control variable, premised on network theory that is included as well. This is next reviewed.

Strategic Orientation

Inherent to the definition of networks is the concepts that organizations join a network to do something they could not do alone. That is, networks are purposeful. Having a specific purpose creates a strategic origination. For instance, networks may exist for

conserving a resource or providing a specific service. Once they have a goal a strategy helps the networks to define a strategic orientation. Strategic orientation is defined here as: “The pattern of action through which organizations propose to achieve desired goal, modify current goals or realize opportunities (Rubin, 1998, p. 88). In other words a strategy is just a plan for producing outputs. However an organization or network has choices about their strategy. And as purported earlier often within their public sector when multiple and or ambiguous goals exist the strategic origination of t a network s can vary. The strategic orientation is the choice a network makes about in order to produce an output.

Typologies defining networks have exhumed in the literature that are clearly related to defining the strategic orientation of a network. For instance, Arganoff (2007) explains, “not all networks are alike.” In a case study of 12 networks, Arganoff defines four types of networks: Informational, developmental, outreach and action. A methodology for differentiating the types of networks he studies is not made explicit. However, based on the definitions provided, the typology of networks types is made based on the purpose of the network: Why was the network founded and what do network members do as part of the network. Arganoff’s typologies of types of networks is similar to that of Provan and Milward (2006). Provan and Milward (2006) define four types of networks: service implementation, information diffusion, problem solving and community capacity building. Again, the typology is based on purpose of the networks. In defining what type of network it is or the purpose of the strategy the authors have suggested that networks that have different purpose will behave differently. Normatively if the network is structured horizontally and the purpose for joining and the interdependency clear the strategic

orientation will be the one that increases the production function of the network the greatest.

However, as McGuire (2002) explains, strategic orientation is not so easily defined. He states strategic orientation is "...a complicated environmental factor" (p 606), that concerns "the multiple and sometime conflicting purposes for which networks exist" (p. 606). Provan and Milward (2002) complement McGuire (2002) perspective on the impacts of a complicated strategic orientation. Because there is variance in the structural relationship of networks, and the purpose of the networks may be unclear or many there is need to define and control for the orientation of a network.

The Network to be Studied: The Southern Nevada Public Lands Management Act

The Southern Nevada Public Lands Management Act (SNPLMA) of 1998 was passed by the 105th Congress with the express objective: "to provide for the orderly disposal of certain Federal lands in Clark County, Nevada, and to provide for the acquisition of environmentally sensitive lands in the State of Nevada" (S 25, 1998). Monies from sale of lands were put into a special account for the acquisition of land as well as to provide for:

- capital improvements in enumerated areas,
- development and implementation of a multi-species habitat conservation plan,
- general conservation,
- implementation and management of the Act,
- multijurisdictional hazardous fuels reduction and wildfire prevention plans, and to carry out the
- Eastern Nevada Landscape Restoration Project. (S 25, 1998)

The legislation, between 1998 and 2008, generated \$3,335,172,114 in revenue from the sale of Federal, public lands (Southern Nevada Public Land Management Act:10-Year Report to Congress, 2008).

Specifically, the piece of legislation arises out of a particular need for regional action in southern Nevada. A large portion (80%) of land in Nevada is owned by the federal government. In 1998 rapid growth in the urban center of southern Nevada (Las Vegas) was being hampered by an inability to grow outwards.

The legislation came about in order to allow for contiguous growth of Las Vegas. The legislation allowed for the sale of federally owned lands that blocked the development of urban centers in Southern Nevada. Auctions were held to allow for the purchase by the public and private sector of the federal lands. Monies from the sale of lands were then placed into special accounts for the generally stated purpose to conserve other lands in the region. In this unique case the private sector, federal management agencies, local jurisdictions and special regional districts were brought together in new ways and for new reasons.

The case will focus on the set of projects that fall under the enumerated legislative intent of allowing local jurisdictions and regional actors to acquire funds for the purpose of creating parks, trails and natural areas (PTNA). The PTNA subgroup was founded in order to nominate, review and fund projects. A process from nomination to funding was created that would incorporate multiple organizations in a three step review process. Over 10 years 168 projects have been funded totaling over \$500 million in public funds.

Operations and Measurements

Operationalizing a variable means finding a measurable, quantifiable, and valid index for your variable (<http://jan.ucc.nau.edu/pe/hp602web/HP602VA14.htm>, 5/26/2011). This section of the paper will discuss how each variable is operationalized for the purpose of analysis.

Dependant Variable: Projects

The dependant variable in this analysis is outputs, the actual work of the network (Lynn et. al., 2001). Outputs for the purpose of quantitative measurement are the total number of projects that were nominated and then adjudicated upon during the approval process. During that process a number of projects were not approved for funding. As stated prior the purpose of this analysis is to understand why those projects were approved or not approved. Therefore while the total number of projects is the dependant variable the purpose will be to differentiate between approved and not approved projects. Approved projects, as identified on the SNPLMA main webpage are coded as 1. Non approved projects, as identified, are coded as 0.

Strategic Orientation

In order to control for the strategic orientation of projects, which we know may be a causal factor in some projects being approved over others strategic orientation is operationalized. Each project is classified as having a strategic orientation. Four possible strategic orientations that can be assigned to a project are based on the ranking document first listed in the Implementation Agreement and then used year to year by the network to

evaluate projects. The four strategic orientations include: *Demand, Resource Protection, Connectivity and Cost and Value of Investment.*

In order to assign a strategic orientation to each project, the scoring sheets provided by the BLM, Las Vegas Field Office were reviewed. The raw scores given to each project (by the organizations in the network) for each of the four criterion were calculated as percentages.¹ Then, the percent value each organization gave to a project was averaged. The averages for each criterion were compared. The average highest percent value a project was given in one of the four criteria became the projects strategic orientation.

For example: Project A is assigned raw scores in each of four criteria by several organizations

	Criteria 1	Criteria 2	Criteria 3	Criteria 4
Organization 1	4/18 = 22%	11/18 =61%	4/9 = 66%	6/9
Organization 2	9/18 =5%	12/18 = 66%	3/9 = 77%	7/9
Organization 3	6/19 =33%	17/18=55%	4/9 = 88%	8/9
Average	35%	74%	62%	77%

Therefore, Project A would be assigned a strategic orientation value of 4 as an ordinal dummy value. Strategic orientation will also be used as a control value in regression 1 (approved not approved)

¹ Calculating percentages first was necessary because the raw scores that could be assigned to each project varied. By first computing percentages the original bias in raw score values was eliminated.

Independent Variables

Centralization

Centrality is measured by the formula: The total number of ties that any node has compared to other node ties. Greater centralization means more nodes are connected to one organization than any other in the network. Several ways of defining ties were used to give different meaning to the centralization measure.

First, data was coded based on the organizations that voted together during the process from nomination to approval. As noted in Chapter X, organizations were part of the network to approve parks, trails and natural area in Southern Nevada. However, the Implementation Agreement specified a process for approving these projects that called for organizations to vote on each project. Not all organization voted at the same time. Note, “together” means at the same time; not the same way on a project. Voting together is a measure of “general organizational linkages” (Provan and Milward, 1995). Voting together suggests members from the organization were present at same time and same place. They would receive similar guidance and information and be privy to any current debates. Voting together was identified by reviewing the Implementation Agreement . The groups that voted together were sent to a representative at the BLM Las Vegas field office involved in the administration of SNPLMA for review. A follow up email was received from the PTNA subgroup manager on April 25, 2011 that clarified which organization voted together.

If an organization voted together during the process they were given a 1 if they did not vote together they were given a 0. For example a value of “1” in the intersection of row

A and column B indicates organization A and B voted together, whereas a “0” indicates they did not vote together.

Example:

	A	B	C	D
A	0	1	1	1
B	1	0	1	1
C	1	1	0	1
D	1	1	1	0

In this example all of the organizations listed voted together during the process of nomination to review.

The data is put into a squared or binary matrix. Data from the squared matrix is then used to compute degree centrality. Each organization is given a degree centrality score. The higher the degree score the more central the node or organization to the whole network. Greater centralization means more nodes are connected to one organization than any other in the network. The degree centrality scores will be used in the regression analysis.

However, ties do not completely capture the concept of centralization in a network. Provan and Milward (1995) in a study of a community of human services agencies identified a core agency through qualitative analysis. They then used quantitative measure to verify that the agency they believed was central was statistically central, as well. Their methodology for proving the existence of a core central agency is as follows:

- First, they identified that they believed there was a core agency and why.
- Then, they measured density of the network, with and without the core agency included. A significant difference (using:) was found between the density of the network with and without the core agency. This means, the number of possible linkages is significantly impacted by the core agency.

- Then, they calculated the mean score of all links from other nodes to the core agency. They found that very few agencies had less than 4 links to the core agency.
- They also calculated overall network density with and without the central agency. They found density decreased significantly when the core agency was not present. Meaning the core agency was connecting many of the nodes.

The authors then used this information to create a scale of integration: decentralized, moderately decentralized, centralized, highly centralized (Provan and Milward, 1995).

Like, Provan and Milward (1995) I too believe there is evidence of a core central agency (this may be easily identified using the first operationalization of centrality but it may not, so just in case...). The Bureau of Land Management, Las Vegas Field Office, is the only organization involved that has a staff member that is solely tasked with the administration of PTNA. All documentation is housed at the BLM, Las Vegas Field Office. All publications of PTNA material is made done through the BLM, Las Vegas Field office. In this way, the Las Vegas Field Office is very much like the Provan and Milward (1995) core central agency/ I will use the same statistical process for identifying the centrality of the BLM Las Vegas Field Office.

The third operationalization of centrality is the control of resources. Data on the number of dollars an organization received in each round was collected. The data is put into a square matrix and used to measure organizational centrality as control over resources. In comparison to other agencies, organizations that collected more dollars are more central. Coefficients were then given to each organization in each round and used in the regression analysis.

Hierarchy/subgroups

Hierarchy or the differentiated rank of organizations in the network were identified through content analysis of the Implementation Agreements. As stated earlier found subgroups emerged. A scale of the rank 1-4 was created based on the rank of the organization in the network. Each organization was assigned a value as attribute data in the original centrality formula. In the final regression a dummy variable for being part of one of the ranked subgroups is used to explain outputs.

Goal consensus

Goal consensus is operationalized by change in projects to be funded in each year among subgroups in the network. Projects are approved or not approved in each subgroup the number of projects that change status in each subgroup is used as a measure of goal consensus – do the subgroups concede that projects that are approved by one subgroup are the same as the other subgroups. The project is the goal. The more agreement the greater the goal consensus.

A second measure of goal consensus is also assessed however it cannot be used in the regression analysis, only as a descriptive to help better understand the network. As noted, only some organizations in the network actually ranked projects using the criterion. Differences in how organizations viewed each project is the second measure of goal consensus. A standard deviation for the raw score totals for each project, for each organization is calculated.

Competition

If an organization has a project nominated in the same year as another organization they are said to be in competition with each other. Two scales for competition are created and assessed for fit in the model: (1) competition based on number of dollars being vied for and (2) competition based on number of projects being vied for. The two scales are constructed using break points identified by looking at the range. Then the numbers are entered into a squared matrix. If two organizations are in heavy competition they are given a 3... Then a score is given for each organization that is a measure of how in competition they were with other organization relative to the competitiveness of other organizations. The scores are then used in regression analysis.

The Model

Following the use of network analysis to compute coefficients that measure concepts of organizational structure a logit regression is used to find if network level factors predict approved versus not approved projects. The equation is as follows:

Projects (approved/not approved) = centrality, hierarchy, goal consensus, competition, strategic orientation.

Conclusion

This paper presents an outline for the study of network level factors impact on the work of a network, outputs. The network created to implement aspects of the federal legislations signed in 1998, The Southern Nevada Public Lands Management Act, is used to operationalize variables. This research is to be carried out within the year.