Small Town Services and Facilities: The Influence of Social Networks and Civic Structure on Perceptions of Quality

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In this research, it is posited that perceptions of the quality of services and facilities in small towns are dependent on the social organization of those places. Two components of this social organization are the social capital that inheres among individuals and the civic structure of the town. This hypothesis is tested using multi-level models that combine individual-level social capital and community-level civic structure to explain variations among 99 rural towns in Iowa. I find that civic structure contributes positively and significantly to effects between communities, while individual-level social capital is positive and a significant contributor to effects within communities. The civic structure models explain 32 percent of the variance in perceptions of the quality of core public facilities and services and 43 percent of the variance in secondary public-private services. The strong contributions of individual social capital and civic structure suggest that investments in the micro and macro social structure of small towns can assist in strengthening perceptions of community infrastructure.

Public and private services are the economic and social backbone of American small towns. These infrastructures range from publicly funded road systems, public schools, and water and sewer systems to secondary services such as medical care, housing, and elderly and youth facilities and services. Rural places are experiencing two different realities that affect residents’ perceptions of the quality of their local services and facilities. For some, loss of financial and social resources that support schools, fire departments, water systems, and street maintenance is occurring due to an aging, stagnant population or because of declining economies dependent on mining, light manufacturing, and agriculture (Coates, Jarrett, and Ragunas, 1992). Other towns have high in-migration and the need for growth management as urban sprawl reaches into rural places (Murray, 2000). These small towns often have insufficient infrastructures to meet the needs or expectations of newcomers.

Although these are two vastly different phenomena, both realities challenge rural places and their citizens to reassess local facilities and services and to identify ways to provide expected quality. Some communities successfully respond to these challenges and create infrastructures consistent with the needs and interests of their residents; others fall short. Although small town leaders often focus on garnering and managing tangible assets such as financial capital and natural resources to meet infrastructure needs, investments in

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the social structure can also provide valuable resources for providing goods and services. In this article I examine social components of rural society at two levels (individual-level social capital and community-level civic structure) and how they contribute to perceptions of rural town infrastructure quality.

The size and quality of public and private infrastructures are a function of investment and consumption decisions (Peterson, 1990; Henderson, Lickerman, and Flynn, 2000). Lagging infrastructures resulting in limited and poor quality services and facilities occur when consumption increases and investments decline. Infrastructure investment is not solely an economic problem of supply and demand. In his classic analysis of economic systems, Granovetter (1985) theorizes that embedded social networks are necessary to reduce transaction costs. Henderson, Lickerman, and Flynn (2000) go beyond explanations of economic reduction of transaction costs and suggest that infrastructure investments are political issues influenced by levels of trust in government, proliferation of special interest groups, and the relationships of individual priorities and broader community ones. Public infrastructure financing is highly dependent on citizen willingness to be taxed (Peterson, 1990). Private infrastructures reflect citizen consumption demands and are constrained by public laws and regulations. Activities by community organizations, business establishments, politicians, and community leaders affect the consumption and investment process uniquely in different cities (Tarr, 1984). Some towns rely on the mobilization of citizens to volunteer time and dollars for maintenance and construction projects, to write grants, and to lobby federal and state officials; they also rely on other local citizens to undertake important infrastructure projects. In other places, business-taxpayer alliances are used to successfully secure financing for public infrastructures (Peterson, 1990) as well as private ones. Thus, infrastructure development and quality are not just driven by individual demand but are also the result of individual social networks and the social structure of the community itself.

There are currently two streams of social capital theory and research (Portes, 2000) that provide foundations for examining how the social organization of small towns might influence perceptions of infrastructure quality. The first defines social capital as “... a resource for persons” to aid in the achievement of their interests (Coleman, 1988, p. S98). Coleman (1988, 1990) and Bourdieu (1986) elaborate this concept of social capital with a focus on individuals, their connections with each other, and how those relationships are used to create networks of obligations and trust that result in an expansion of personal resources. A second theory frames the connections and relationships among people as a community-level attribute (Flora, 1998; Flora et al., 1997; Putnam, 1993, 2000; Narayan, 2000). Putnam (1993) explains institutional performance using measures of social solidarity and civic involvement to represent regional attributes rather than individual ones. Other researchers do not use the term social capital, but refer to a civic structure of place that is created by multiple networks and institutions that support community problem solving (Lyson, 2001; Morton, 2001).

Although each of these lines of theory has critics and advocates, both are valuable and they are not mutually exclusive. The real issue is one of scale and the transition from the micro (individual) to the macro (community and beyond). Although Coleman’s (1988, p. S101) explanations focus on the social relations of individual actors, he acknowledges that social capital accounts “... for different outcomes at the level of individual actors and [is] an aid toward making micro-to-macro transitions.” He uses as an example the individual who moves from individual protest to organized revolt because of his connections with
others who have similar beliefs and attitudes. In this instance, the nature of the individual’s connections and the multiple relations across many individuals and groups within the space where the revolt occurs are complementary but distinct levels of action. Stone (2001) notes that because social capital has not been restricted to particular social networks of one size or another, it has been used as a micro and macro measure of social organization (within families, see Coleman, 1988; Amato, 1998; Furstenberg and Hughes, 1995; Freudenburg, 1986; regarding local and community networks, see Putnam, 1993; Flora et al., 1997; and for nation states, see Knack and Keefer, 1997). Little (1991) reinforces the idea that micro foundations and macro structures are both important for understanding the processes of social phenomenon.

In this research, the term social capital is restricted to the micro and placed in a hierarchical relationship nested within the civic structure of community. Thus, social capital is defined as an attribute of an individual’s human relations and characterized by personal norms of trust and reciprocity (Coleman, 1988, 1990; Stone, 2001). Civic structure is defined by the multiple, dynamic relations among many networks and characterized by norms of cooperation and community benefit. It is widely shared community norms of cooperation and mutual benefit (i.e., high civic structure) that give places the capacity to meet the collective needs of small town citizens.

To test the ability of this hierarchical structure concept to predict perceptions of small town infrastructure quality, an existing data set of 10,798 individuals in 99 rural Iowa towns with populations between 500 and 10,000 is used. First, a theoretical framework is offered to posit the relationships of social capital, civic structure, and small town infrastructures. Then, hypotheses are formulated. Two categories of small town services (core public services and secondary public-private services) are tested. A discussion of findings is followed by implications and conclusions.

SOCIAL CAPITAL

The relationships among individuals are considered one of the building blocks of civil society and civic communities. These relational networks, which are frequently labeled social capital, provide resources to the individual and community and are a source of collective actions (Coleman, 1990; Woolcock, 1998; Putnam, 2000). Stolle and Rochon (1998) distinguish two types of social capital: private civicness and public civicness. Private civicness is based on interactions and levels of trust built between group members; public civicness occurs when groups cooperate and interact beyond the personal face-to-face boundaries of their own group. Portes (2000) also observes that the social capital discussion is really about two different conceptualizations: the property of individuals and the property that belongs to the whole community. These distinctions provide a framework for theorizing and operationalizing social capital and civic structure.

Bourdieu (1986) and Coleman (1988, 1990) conceptualize social capital as those relationships that benefit the individual and that person’s family (Portes, 2000). This private face consists of networks of acquaintances, friends, family, and groups that individuals experience. These relationships range from dyads between close friends to memberships in local organizations. Networks are built on close ties to family, kin, and friendship based in cultural or social homogeneity. The relations among persons are resources for individuals that “…inhere in the structure of relations between actors” (Coleman, 1988, p. 98).
Bourdieu (1986, p. 241) writes, “the forms of capital are resources which yield power and involve the capacity to exercise control over one’s own future and that of others.”

A second type of social capital reveals a public face—relationships whose benefits accrue to the community. Portes (2000, p. 3) attributes this social capital to a “network of traders” in towns, cities, and communities that build social, political, and economic relationships. Many of these networks consist of the weaker ties of acquaintanceship and personal common interests (Granovetter, 1985). Putnam’s (2000) social capital is closely related to civic virtue and focuses on relationships that support solidarity and/or inclusive identities that produce collective benefits. He refers to social capital as “…networks, norms, and trust that facilitate coordination and cooperation for mutual benefits” (Putnam, 1993, pp. 35–36). For Putnam, many virtuous but isolated individuals equal low social capital. These networks can be private relationships (friends and relatives) and/or relationships consisting of acquaintances and strangers around common concerns. The mutual benefit provides individual personal gain and the potential for group and/or community benefit.

“Groups and associations may produce high levels of personalized social capital but fail to produce public social capital” (Stolle and Rochon, 1998, p. 49). Wollebaek and Selle (2002) also note that citizens may trust each other and be highly connected but that this resource may not be accessed by the community in which they live. Thus, public-level effects are not synonymous with community benefit. When an individual holds membership in a group, benefits have the possibility of accruing to the individual, the group, and/or the community as a whole (Schulman and Anderson, 1999). If no benefits accrue to the individual, that person is likely to exit the group. However, group benefits can occur without creating community-at-large benefits (Paxton, 1999). Therefore, not all social capital that has been labeled “public” necessarily benefits the entire community. Those network relationships of trust that are confined to specific organizations and specific interests build a different kind of civil society and community benefit than those with relationships across diverse community organizations (Etzioni, 1991).

Public social capital is the transition point from micro to macro scale, from personal networks to community-wide networks. When these connections occur in a “public” group setting but benefits are restricted to members of the group, social capital retains its micro personal resource meaning. However, when benefits accrue beyond individuals and their personal groups to the larger community, a macro scale of relationships evolves. It is the action/inaction of multiple citizens and groups that create community norms of trust and a macro structure characterized by some degree of high to low expectations of community benefit.

The multiple meanings of social capital have made it difficult to empirically test its effects. In this article I suggest that social capital be limited to the relationships of individuals that provide personal resources. The webs of relationships and norms of mutual benefit at community and regional levels are a structural concept distinct from individual circles of relations.

CIVIC STRUCTURE

As social networks grow within communities, they evolve into multiple structured groups, with each group having specific goals and actions that may include public-level effects. The extent to which these complex social relations within and across different institutions have
overarching norms of community benefit constitutes the civic structure of a community. The concept of civic structure is based in the use of civil society as an adjective for a particular kind of society (Edwards, 2000). Such a society is normatively described as one characterized by high levels of trust among members, tolerance, cooperation, and civilness. Wollebaek and Selle (2002) describe this society as a civic community, a community in which informed citizens actively participate and undertake collective actions. Warner (1999) theorizes social capital as “public” capital when it supports processes of public involvement and decision making thereby creating a civic infrastructure. Further, she suggests that there are “... important links between social capital, civic infrastructure, and the productivity and efficiency of community services” (Warner, 1999, p. 375).

The civic structure of a community consists of normative expectations that multiple individual and group actions will lead to solving collective problems in the broad community interest. Encompassing the ideas of civic culture (Verba, Schlozman, and Brady, 1995), civic engagement (Putnam 1993, 2000), and civic norms (Naidoo and Tandon, 1999), a community with high civic structure has multiple groups that negotiate and compromise with each other to construct social, economic, and political institutions that meet their collective needs. The level of civic structure reflects the capacity of communities to solve problems such as the allocation of public resources in the community interest and the facilitation of the private exchange of goods and services. This capacity is only realized when there are perceptions that a problem exists and it requires collective efforts to resolve. High levels of interaction and communication across community groups and sectors expand the resources of the community by integrating different population perspectives and skills in the search for solutions to community problems.

Wilkinson (1991) proposes that the social interactions that define the local community field are generalized interests of the community rather than specialized interests of particular groups. The community field is a nonreducible unit that “... provides the associations that comprise the local society” and “... gives structure and direction to processes of collective action” (Wilkinson, 1991, p. 13). Wilkinson’s (1991) community field structure is measured by actors, organized and unorganized associations, and activities that manifest interest in local aspects of social life. These social relations cut across groups and other interaction fields and combine locally relevant aspects of society with special interest fields.

Flora et al. (1997) ask why some communities are economically vital and others not. Their explanation is that economic behaviors are embedded in the social structure of places and that the social interactions that create social structure differ among rural places. They suggest that entrepreneurial social infrastructure (ESI) converts social relations into organizational forms that enable collective community action and positive economic outcomes. Entrepreneurial social infrastructure consists of legitimacy of alternatives (acceptance of controversy, depersonalization of politics, focus on process), mobilization of resources (individual and collective), and localities networks that are diverse and inclusive and have permeable community boundaries. They find that successful economic development projects are found in nonmetropolitan places with higher scores on measures of ESI. A civic structure has social interactions that contain a high degree of inclusiveness, tolerance for minority group perspectives, and active participation in public problem solving (Etzioni, 1991; McLennan, 1995; Flora, 1998; Young, 1999). This suggests a directional relationship between the level of civic structure and the quality of small town facilities and services.
Community problem solving includes planning, financing, and organizing public- and private-sector infrastructures. The term infrastructure consists of “... long-lived structures and equipment systems that provide basic services to households and firms” (Henderson, Lickerman, and Flynn, 2000, p. 237). Infrastructure encompasses physical components and human, organizational, and administrative elements that maintain regional productivity and competitiveness (Roborgh, Stough, and Toonen, 1988). Public infrastructures such as roads, bridges, water and sewer systems, schools, police and fire systems (Tarr, 1984; Roborgh, Stough, and Toonen, 1988; Henderson, Lickerman, and Flynn, 2000) are found in most small towns. These are services and facilities that are created through taxpayer investments and offered to all community residents for consumption. Other rural town infrastructures vary by community and include medical facilities, housing stock, firms that offer employment, telecommunication systems, childcare services, and youth and elderly services. These are funded through private and public-private partnerships.

Public and private infrastructures are essential components of quality of life and contribute to the economic and social viability of American places (Dahms, 1987; Henderson, Lickerman, and Flynn, 2000). Many policymakers suggest that communities where citizens engage each other and act together to solve community problems will have better economic and social outcomes (USDA Natural Resources Conservation Service and Environmental Protection Agency, 2000). Researchers have found that regional institutional performance (Putnam, 1993) and economic development (Flora, 1998; Flora et al., 1997) are positively associated with social capital, civic engagement, and community-level action. Tarr (1984) finds that variations among cities in the building of infrastructure are more likely to be related to differences in business and political leadership within each city than to a general set of factors that relate to all cities.

Infrastructure quality can be measured through satisfaction and attitude surveys as well as by specific objective performance measures set by experts and/or citizens. In this project, citizen perceptions of their services and facilities are used as indicators of quality. Argyle (1996) challenges the use of objective measures of quality of life such as economic outcomes or job creation. He suggests that social and economic concepts of quality of life should include perceptions of happiness and satisfaction. Seed and Lloyd’s (1997) definition of quality of life as based on community values also provides support for this approach. They focus on the interrelatedness of quality of life experiences and link individual relationships in the community to conditions within the city or region where individuals live.

Two analyses of infrastructures are examined. The first is restricted to public services that most rural towns offer. The second includes a variety of other public and private infrastructures that are often found in rural towns. In the United States, public infrastructure investments are the result of elected official decisions and citizen voting patterns (Peterson, 1990). These core public services are available because of collective decisions to finance them (or not) and thus are mainly left to the political decision-making process (Biehl, 1991). It is expected that high levels of social capital nested in places with high civic structure will result in quality infrastructure investments and have citizens who perceive they have a good infrastructure. Although citizens’ collective efforts are necessary for public services, it is less clear whether private services or public-private combinations are similarly affected by civic structure. Marketplace mechanisms of supply-demand and
economies of scale may render these efforts less important. Thus, the second analysis is used to determine if public-private combinations respond differently than public services. It is posited that social capital nested in a civic structure will lower the transaction costs of private exchanges and thereby increase the perceived quality of these infrastructures.

RESEARCH DESIGN

The working hypothesis that positive perceptions of infrastructure quality are associated with high levels of individual social capital nested in small towns with high civic structure can be separated into three specific hypotheses. The first two test the contributions of micro-level private and public social capital. The third tests the significance of civic structure in predicting perceptions of small town infrastructure.

H1: Individual-level, private social capital is positively associated with perceptions of the quality of core and secondary infrastructures, controlling for civic structure.

H2: Individual-level, public social capital is positively associated with perceptions of quality of core and secondary infrastructures, controlling for civic structure.

H3: The civic structure of community is positively associated with perceptions of quality of core and secondary infrastructures.

Multi-level modeling provides statistical tools for testing conceptual models of the multi-level structure of society (Bryk and Raudenbush, 1992). In this research, the personal relations of individuals are confined to the first level. Indicators selected to represent social capital are based on the self-reported personal relationships of 10,798 individuals that are randomly sampled. Civic structure, an attribute of the 99 towns where the surveyed individuals live, comprises Level 2 of the model. Measures of civic structure are derived from these same individuals acting as key informants reporting on the institutional features of their town (Young, 1999).

Hierarchical linear modeling is used to partition the variances of community and individual effects, thereby separating statistically the true variance of each level from the sampling variance (Garner and Raudenbush, 1991). Two equations are estimated simultaneously—within-community and between-communities. The within-community equation regresses individual perceptions of small town services on individual, private and individual, public social capital while controlling for respondent’s age, length of residency, education, and household income within each community. Between-community equations at the town level model parameters (intercepts and slopes) from the within-community equations as a function of civic structure scores controlling for town population, median age, percent high school graduation, median household income, and population change 1990–2000.

Data to test the hypotheses are drawn from the Rural Development Initiative (RDI) stratified random sample survey of 99 rural towns conducted by Iowa State University in 1994 (Ryan, Terry, and Woebke, 1996). A three-stage random sampling procedure was used to select towns, households, and respondents. The sample was drawn from Iowa’s 408 small towns (population 500–10,000) that are not contiguous to a metropolitan center. Smaller communities (under 500 residents) were excluded to limit the study to towns where at least minimal services were offered. The sample went beyond the conventional definition of rural communities (population 2,500) to encompass places that serve as local regional centers for rural residents. To obtain a geographical balance, one small town per county (99 counties in Iowa) was randomly chosen from all the small towns in that county.
Within each selected town, a random sample of 150 households was drawn from the local telephone directory. Lastly, the head of each selected household was asked to participate, or a co-head was randomly selected. A 72.7 percent response rate yielded 10,798 responses, with response rates for individual towns ranging from 62–83 percent.

Sixty-three percent of the respondents lived in their community more than 20 years. The average education is high school graduate or above. One-third of rural town respondents in this sample are under 45 years of age and another third are 65 years and over (Besser et al., 1998). Fifty-nine percent of the respondents reported household incomes between $20,000–59,999. According to the 1990 U.S. Census, the average population of the 99 rural towns is 1,802, median age is 39, and median household income is $22,811. On average, 75 percent of the adult population has a high school education. Population changes from 1990 to 2000 range from –21 percent to +53 percent, yielding 3.6 percent growth on average. Appendix A summarizes the proportion of residents of these rural towns that say a particular service is available. Core public services, on average, are available 92 percent of the time; secondary public-private services, on average, are available 77 percent of the time.

MEASURES

DEPENDENT VARIABLES

Two indices of small town services (perceived quality of core public and secondary facilities and services) are used as dependent variables (Table 1).

The first index, core public services, consists of fire protection, streets, water, and public schools. When groups of people who live in close proximity incorporate into “city” status based on their state constitution and codes, they collectively assume certain responsibilities for basic public services. The power and decision making for the city is vested in an elected city council (Iowa Code, section 364.2(1)) with an elected mayor serving as presiding officer over the city council and chief executive officer of the city (Iowa Code, section 372.14). This means that small Iowa towns (cities) have the power to tax their residents to finance public services. Under Iowa law, cities must provide fire protection (Institute of Public Affairs, 2000). Public works refer to a variety of capital-intense services that include streets and water service. These are “... critical to the basic functioning of any modern community” (Institute of Public Affairs, 2000, p. 6). Streets have safety (e.g.,

TABLE 1. Indices of Rural Town Services

| A. Index of core public services, summated scale consisting of four variables based on individual perceptions |
| “Please rate the following government services available in (community name)” | 4 = very good, 3 = good, 2 = fair, 1 = poor |
| fire protection; streets; water; public schools |
| Range of scores 4–16; \( \alpha = 0.61 \); mean score 11.84; SD 2.10 |

| B. Index of secondary public-private services, summated scale consisting of six variables based on individual perceptions |
| “Please rate the following services/facilities” | 4 = very good, 3 = good, 2 = fair, 1 = poor |
| senior programs, youth programs; childcare services; adequate housing; medical services; recreation |
| Range of scores 6–24; \( \alpha = 0.74 \); mean score 13.98; SD 3.35 |

*Respondents who indicated the service was not available in their community are not included. (See Appendix A for response distribution by town size.)
SMALL TOWN SERVICES AND FACILITIES

repair and hazard prevention, street lights) and aesthetic aspects (e.g., curbs and gutters, signs). Iowa’s 408 small cities (e.g., rural towns) may contract indebtedness so they can own and operate their own waterworks or grant a franchise for the operation of water services for residents. Lastly, local governments, through elected school boards, are required by state law to offer education for their young people. Although rural school districts usually extend beyond “city” limits, decision-making powers reside in the ability of the rural town to control (greatest number of voters) who is elected and what policies are implemented.

The second index of small town services consists of other services that are provided by government, private firms, and public-private partnerships. The secondary services used in this index are medical services, housing, childcare, youth programs, senior programs, and recreation services (Table 1B). They are considered secondary because their existence is more voluntary in contrast to core public services. These services are unique to each small town and often result from public-private partnerships. For example, the community center is frequently built from a combination of private donations, public dollars, and community fund raising. This building serves to support senior, youth, and recreation programs. Senior programs use local volunteers as well as state and federal flow-through dollars (e.g., congregate meal sites) and often are held in the community center or local churches. Youth programs can include public dollars (e.g., budget line items and grants), not-for-profit organizational sponsorships (e.g., 4-H, Boy Scouts, Girl Scouts, Future Farmers of America), and voluntary organizations (e.g., baseball and soccer teams). Youth programs can utilize public facilities, including school grounds, parks, and the community center, but be sponsored by private firms and voluntary organizations. Recreation programs may be voluntary organizations (e.g., sports teams) that use public facilities (e.g., school gym and pool, parks) or be private firms that offer bowling, roller-skating, swimming, and other recreation services. Two services (housing and childcare) are distinctly private services that are affected by market demand and supply. The last service in this index is medical services. Medical services include hospitals, physicians, and auxiliary health care services. Although frequently considered a private service, most rural hospitals were built in the 1950s through community-federal dollar matches as a result of the Hill Burton Act. Threats of hospital closures and changes in the medical care infrastructure have stressed small towns and resulted in residents working together to save their hospital to retain access to health care services (Morton, 2001).

Both these dependent variable indices represent citizen perceptions of the quality of services they have in their town. Perceptions and beliefs about local services arise from personal experiences, systematic/unsystematic observations, scientific facts, and unverified assumptions. These combinations lead to satisfaction/dissatisfaction with the place where a person lives and create motivations to stay or leave.

LEVEL 1: INDIVIDUAL SOCIAL CAPITAL MEASURES

The empirical operationalization of social capital requires measures of social structure (networks) and the quality of that structure (norms of trust and reciprocity) (Coleman, 1988, 1990; Bourdieu, 1986; Putnam, 1993, 2001; Stone, 2001). Structural elements reveal whether people know each other; norms, trust, and confidence represent the nature of their relationships. Measures of individual-level social capital have been conceptually separated into personal networks and norms of reciprocity that: (1) offer resources for private benefit and (2) provide public resources (Table 2).
TABLE 2. Measures of Individual Level Social Capital

A. Personal Benefit Index

This summated scale of individual personal networks and norms of reciprocity within the town where respondent lives consists of the following five variables:

**Personal Networks**
1. "About what proportion of the adults living in (community name) would you say you know by name?"
   1 = none or very few of them, 2 = less than half of them, 3 = about half of them, 4 = most of them, 5 = all of them
2. "About what proportion of all of your close personal adult friends live in (community name)?"
   1 = I really have no close personal friends, 2 = none of them live here, 3 = less than one-half of them live here, 4 = about one-half of them live here, 5 = most of them live here, 6 = all of them live here

**Personal Norms of Reciprocity**
3. "If I feel just like talking, I usually can find someone in (community name) to talk to." 1 = strongly disagree to 5 = strongly agree
4. "I can always count on my neighbors when I need help." 1 = strongly disagree to 5 = strongly agree
5. "If I had an emergency, even people I don’t know would help out." 1 = strongly disagree to 5 = strongly agree

Range of scores 5–26; α = 0.68; mean score 19.47; SD 2.86

B. Individual Public Social Capital Indicators

These measures reflect individual networks that can be used as public resources.

1. "Considering ALL of the types of groups and organizations listed above, about how many LOCAL groups in total do you belong to?"
   Range of scores 0–15; mean score 2.18; SD 1.91
2. "In general, how would you describe your level of involvement in local community improvement activities and events?" 1 = not at all active, 2 = not very active, 3 = somewhat active, 4 = very active
   Mean score 2.55; SD 0.83

**Personal Benefit Index.** Two measures of individual network structure and three indicators of personal norms of reciprocity are summed to make a five-item scale of personal benefit (Table 2A). The network structure indicators represent informal networks of neighbors, friends, and community members the individual knows (Glynn, 1981; Riger and Lavrakas, 1981; Baum, Cooke, and Murray, 1998). Indicators of personal trust and reciprocity are based on individuals’ experience and the extent to which their relationships can be accessed as positive, personal resources. The third and fourth statements refer to a network of people the individual knows and trusts. Some people in this network offer social support because individuals can confide in them or turn to them for help in an emergency (Stokes, 1983). The last statement extends the individual’s norm of trust and reciprocity to a generalized trust in other community members. This generalized trust is extended to strangers with the expectation that it will be reciprocated (Putnam, 1998; Cox and Caldwell, 2000; Stone, 2001).

Stone (2001) notes that it is appropriate to use behavioral outcomes of social capital as indicators when they are proximal indicators, that is, outcomes that are closely related to core components of networks, trust, and reciprocity. Krishna and Shrader (1999) use hypothetical scenarios to validate that trust and reciprocity are occurring.

**Individual as a Public Resource.** A second kind of social capital at the individual level is the individual as a public resource (Table 2B). The first indicator is a self-report number of local groups and organizations the respondent belongs to without regard for a community benefit norm (Putnam, 1998; Stone, 2001). The second indicator captures the quality of personal involvement in relationships that directly benefit the community.
indicators are not made into an index for theoretical and technical reasons. Although these both meet the public social capital criteria, simply belonging to a group does not necessarily mean that community benefit occurs. Further, these two indicators did not cluster together in principal component analysis. The second indicator offers intensity of action and action in the public benefit.

LEVEL 2: MEASURES OF CIVIC STRUCTURE

As individual networks are interwoven in a community, the social networks and norms of reciprocity at the community level become more complex. Individual networks and norms reproduce a level of civicness that can be more or less than the aggregate of individual connections. Thus, the scale of relations changes and the overall social structure of the community differs from town to town. It has been hypothesized that the quality of services of small towns is not just the result of individual connections with each other but also the relational structure evidenced by the community as a whole. At the community level, the intent is to measure the overarching networks and norms of civicness that support/obstruct the production of community services. Measures of civic structure are based on asking town residents to act as key informants about their town (Young, 1999). Stone (2001, p. 19) suggests that asking people to answer questions about their community provides a “perception of the overall culture of cooperation in a local area.” Putnam (1993, 2000) uses civic engagement as an indicator of the quality of social networks. What he and others have not done, however, is to distinguish between measuring different scales or levels of civicness. Since summing individual networks to the community level is an inadequate measures of community structure, a way must be found to measure the overall quality of community networks and norms. Proximal indicators of outcomes directly related to community norms of civicness are gathered through the key informant survey. The key informant survey provides a summary of the civic reputation of the town based on the average evaluation of 150 respondents in each town.

The civic structure index (Table 3) represents the nature of the multiple relations among many people in the small town. It consists of community-level norms of reciprocity and shared expectations that people will do what is best for the community. Two measures offer an assessment of how connected or fragmented the networks within the town are and the

**TABLE 3. Index of Civic Structure**

<table>
<thead>
<tr>
<th>Community Norms of Civicsness</th>
<th>Description</th>
<th>Possible Range</th>
<th>Mean Score</th>
<th>SD</th>
<th>Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>“When something needs to get done in (community name), the whole community usually gets behind it.”</td>
<td>4 – 18</td>
<td>13.26</td>
<td>0.72</td>
<td>0.70</td>
</tr>
<tr>
<td>2.</td>
<td>Failure of people to work together</td>
<td>1 = strongly disagree to 5 = strongly agree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>“Community clubs and organizations are interested in what is best for all residents.”</td>
<td>1 = strongly disagree to 5 = strongly agree</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Most everyone in (community name) is allowed to contribute to local government affairs if they want to.”</td>
<td>1 = strongly disagree to 5 = strongly agree</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Possible range 4–18; α = 0.70; mean score 13.26; SD 0.72
overall ability of the town to deal with problems that need addressing. Variations of the second indicator of network fragmentation, “people won’t work together to get things done for this community,” have been used by others. The third indicator asks the key informant to assess the civic norms of the local network structure of groups and organizations. The last indicator measures the civic norm of inclusiveness, asking if people in the community are permitted to contribute to local government affairs.

CONTROL VARIABLES

Control variables are used at the individual and community levels. Individual-level controls include age, income, education, and number of years residing in the community. Community-level control variables are drawn from the U.S. Census: median age, median income, percent of adults graduated from high school, and change in population from 1990 to 2000.

ANALYSIS AND RESULTS

Perceptions of small town core public and secondary services and facilities are modeled separately to test the hypotheses. Three progressively complex models are fitted to each of the service indices (Tables 4 and 5).

The first model is a random-effects analysis of variance (ANOVA) that provides information for calculating how much of the variation in individual perceptions is between communities rather than within communities. In this study, 15.2 percent of the variation (intra-class correlation)^2 in perceptions of core public services is between communities (Table 5), while 12.5 percent of the variation (intra-class correlation) in perception of secondary services is between communities (Table 6). These intra-class correlations support the hierarchical structure framework theorized and are preliminary evidence of substantial differences between communities in both categories of services.

The second model (random slope model) controls for individual-level variables (centered on the group mean) of social capital and basic demographics. In this model, Level 1 error terms are tested for randomness. Only random errors are retained for those individual-level variables that vary significantly between communities. Variables that do not significantly vary between communities are considered fixed and the error term is dropped in Model 3.5

The third model (intercept as outcome) adds community-level variables measured by the grand mean—civic structure index, town population, median age, median household income, population change 1990–2000. This model partitions individual-level and community-level characteristics to determine the significant contribution of between-community differences. The remaining variance in this model is used to compute the amount of variance community-level variables explains. Pseudo $R^2$ is calculated by subtracting the remaining variance in Model 3 from the variance remaining after computing the random slope model with random errors appropriately specified, then dividing by the random slope model variance. Thirty-two percent of community-level variance is explained in the test of perceptions of core public services, while 43 percent of community-level variance is explained in the test of perceptions of secondary services. It is clear from these percentages that community-level structure attributes are a large part of the variance of both services.
TABLE 4. Multi-Level Models of Social Structure Effects on Perceptions of Rural Core Public Services (99 Towns)

<table>
<thead>
<tr>
<th>Fixed Effects Within Community</th>
<th>Model 1 (ANOVA)</th>
<th>Model 2 (Random Slope)</th>
<th>Model 3 (Intercept as Outcome)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Effect $\theta$</td>
<td>se</td>
<td>$t$</td>
</tr>
<tr>
<td>Community mean score of perception of core public services quality</td>
<td>11.951</td>
<td>0.091</td>
<td>131.83***</td>
</tr>
<tr>
<td>Social capital-private index#</td>
<td>0.245</td>
<td>0.012</td>
<td>20.48***</td>
</tr>
<tr>
<td>Number of groups belong to#</td>
<td>−0.012</td>
<td>0.019</td>
<td>−0.63</td>
</tr>
<tr>
<td>Level of community involvement</td>
<td>0.116</td>
<td>0.044</td>
<td>2.61**</td>
</tr>
<tr>
<td>Age</td>
<td>0.024</td>
<td>0.003</td>
<td>8.84***</td>
</tr>
<tr>
<td>Length of residence#</td>
<td>−0.001</td>
<td>0.002</td>
<td>−0.28</td>
</tr>
<tr>
<td>Education</td>
<td>0.064</td>
<td>0.028</td>
<td>2.27*</td>
</tr>
<tr>
<td>Household income</td>
<td>0.061</td>
<td>0.019</td>
<td>3.23**</td>
</tr>
<tr>
<td>Effects of Between Community Variables</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Civic structure index</td>
<td>0.472</td>
<td>0.128</td>
<td>3.69***</td>
</tr>
<tr>
<td>1990 Census population</td>
<td>0.000</td>
<td>0.000</td>
<td>1.75</td>
</tr>
<tr>
<td>Median household income</td>
<td>0.000</td>
<td>0.000</td>
<td>3.10**</td>
</tr>
<tr>
<td>Percent high school graduate</td>
<td>2.590</td>
<td>1.772</td>
<td>1.46</td>
</tr>
<tr>
<td>Median age</td>
<td>0.042</td>
<td>0.017</td>
<td>2.41*</td>
</tr>
<tr>
<td>Population change 1990–2000</td>
<td>0.291</td>
<td>0.658</td>
<td>0.44</td>
</tr>
</tbody>
</table>

Variance among communities | 0.65380 | 672.47 | 98 | 684.12 | 843.17 | 94 | 0.46605 | 576.67 | 88 |

Total variance 4.30883
Intra-class correlation 15.2%
Pseudo $R^2$ 31.9%

Intra-class correlated computed $\text{Estimate} \times \frac{0.65380}{0.65380+0.46605} = .1517$

Pseudo $R^2$ computed $\frac{(0.68412) - (0.46605)}{0.68412} = \frac{0.21807}{0.68412} = .3187$

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$ #errors are random.

Almost one-third of the between-community variation in perception of core public services and facilities is explained by the hierarchical models in Table 4. This means there are significant community-to-community differences in perceptions of public services when individual and small town characteristics are controlled.

At the individual-level, the social capital private index has the largest coefficient ($\theta = 0.245$) and a highly significant, positive effect on perceptions of core services. This provides support for Hypothesis 1. Individual public social capital variables...
### TABLE 5. Multi-Level Models of Social Structure Effects on Perceptions of Rural Secondary Public-Private Services (99 Towns)

<table>
<thead>
<tr>
<th>Fixed Effects</th>
<th>Model 1 (ANOVA)</th>
<th>Model 2 (Random Slope)</th>
<th>Model 3 (Intercept as Outcome)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Effect $\theta$</td>
<td>se</td>
<td>$t$</td>
</tr>
<tr>
<td>Community mean score of perception of secondary services quality</td>
<td>13.758</td>
<td>0.135</td>
<td>101.86***</td>
</tr>
<tr>
<td>Social capital-private index</td>
<td>0.343</td>
<td>0.020</td>
<td>17.51***</td>
</tr>
<tr>
<td>Number of groups belong to$^b$</td>
<td>0.055</td>
<td>0.039</td>
<td>1.39</td>
</tr>
<tr>
<td>Level of community involvement</td>
<td>0.377</td>
<td>0.076</td>
<td>4.98***</td>
</tr>
<tr>
<td>Age$^b$</td>
<td>0.037</td>
<td>0.005</td>
<td>7.72***</td>
</tr>
<tr>
<td>Length of residence$^a$</td>
<td>$-0.009$</td>
<td>0.004</td>
<td>$-2.20$***</td>
</tr>
<tr>
<td>Education</td>
<td>0.050</td>
<td>0.038</td>
<td>1.33**</td>
</tr>
<tr>
<td>Household income</td>
<td>0.018</td>
<td>0.027</td>
<td>.66</td>
</tr>
</tbody>
</table>

**Effects of Between Community Variables**

| Civic structure index | 0.676 | 0.152 | 4.45*** |
| 1990 Census population | 0.000 | 0.000 | 7.78** |
| Median household income | 0.000 | 0.000 | 1.31 |
| Percent high school graduate | 5.232 | 2.562 | 2.04* |
| Median age | 0.044 | 0.024 | 1.83 |
| Population change $^{1990-2000}$ | 0.200 | 1.000 | 0.20 |

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>$X^2$</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance among communities</td>
<td>1.39381</td>
<td>568.65</td>
<td>98</td>
</tr>
<tr>
<td>Total variance</td>
<td>11.11299</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intra-class correlation</td>
<td>12.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pseudo $R^2$</td>
<td>43.1%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$^a$Intraclass correlated computed $\frac{1.39381 - (1.36201 / 9.7918)}{1.39381} = \frac{0.3031}{1.39381} = .1254$

$^b$Pseudo $R^2$ computed $\frac{(1.48667 - .84591)}{1.48667} = .431$

**$*** p < 0.001; ** p < 0.01; * p < 0.05; errors are random.**

Offer mixed results. Level of community involvement has a relatively large coefficient ($\theta = 0.115$, $p = 0.044$) compared to personal demographic characteristics and a significant, positive effect. The coefficient for number of groups that the individual belongs to is negative and not significant. This suggests that more than group membership is necessary for community benefits to evidence themselves. Three individual-level demographic control characteristics (age, education, household income) have smaller, positive coefficients that are significant. Thus, there is partial support for Hypothesis 2.
The civic structure index has a significant positive association with the perceived quality of core public services and provides support for Hypothesis 3. The civic structure coefficient ($\theta = 0.472$) in Model 3 indicates that a large portion of the mean community perception of public infrastructures (intercept)—net of individual social capital and personal characteristics—is explained by small town civic attributes. Only two other variables at the town level, median household income and median age, are significant and positive, although their coefficients are quite small. Thus, if two citizens have identical individual social capital and personal characteristics, differences in perceptions of their public services can be attributed to town-level attributes of civic structure, median household income, and median age of town residents. Overall, both individual social capital characteristics and community-level structure factors are important determinants of perceptions of core public infrastructure quality.

Forty-three percent of the between-community variation in perception of secondary services and facilities is explained by Model 3 in Table 5. The individual, public social capital variable (level of community involvement ($\theta = 0.380$)) has the largest Level 1 positive and significant coefficient followed by the social capital private index ($\theta = 0.343$). These findings support Hypotheses 1 and 2 and provide evidence that individual social capital as a private and public resource is an important determinant of small town perceptions of secondary infrastructure quality. This suggests that individual social capital is part of the micro processes that support the construction of quality secondary rural infrastructures. Other significant parameters with much smaller coefficients at the individual level are education, age, and length of residence. Length of residency is negatively associated with secondary services. People who have lived in a place fewer years are more likely to perceive secondary services in their town to be of higher quality than those who have longer residency.

As in the core public services model, the civic structure index coefficient for small town secondary services is positive, significant ($\theta = 0.676$), and has a larger coefficient than all other variables except percent of high school graduates. This finding supports Hypothesis 3, which posits the importance of civic structure. Percent of high school graduates is positive and significant ($\theta = 5.232$). This means that small towns with a higher percent of high school graduates are more likely to have residents that perceive they have higher quality of secondary services than towns with lower percent of high school graduates. One other town-level variable, 1990 Census population, is significant but has no measurable coefficient. This suggests that these findings are supportable for the range of rural Iowa towns with populations in the 500–10,000 range.

DISCUSSION AND CONCLUSION

Although basic public, small town services were analyzed separately from other types of services available in rural towns, they have similar responses to variations in social capital and civic structure. The nested relations of individuals within a community structure of strong norms of mutual benefit effectively predicted perceptions of small town services.

Social capital is a slippery concept. One goal of this study is to put some boundaries on it by separating the relations of individuals from the normative relations of community. Confining social capital to Coleman’s concept as a neutral attribute of human relations—a social structure that serves as a resource for actors seeking the achievement of certain
goals—provides a foundation for empirical testing. Greeley (1997) charges that any other conceptualization of social capital is an abuse and misuse of the term.

The separation of individual and community relations provides a micro-macro theory of relational nesting—individual connections within the structure of community relations. Multi-level analysis offers a way to model these relationships. Networks and norms of trust and reciprocity occur at multiple levels: as individual connections set within groups and community, and community connections are nested in regional, state, national, and global relations. Measurements and outcomes differ as the scale of relations change. When the scale is not accounted for, units of analysis and chosen indicators may misrepresent the interactions that occur. Conceptual and empirical separation of individual and community provide a way to link social capital and civic structure without confusing levels of analysis.

This study has a number of limitations. The first one is that this is a stratified random sample of small rural towns in Iowa. Findings are not generalizable to small towns elsewhere. Survey towns generally are agriculturally based with relatively homogenous white populations from predominately European and Scandinavian countries. Small towns with different economic and cultural bases may have social interactions that lead to other outcomes. Future research should address regional differences to determine the extent to which these findings are generalizable. Second, this research is based on perceptions of rural infrastructure quality. Future research should also use objective measures of social and economic outcomes to test the strength of proposed hierarchical models. As more cities create indicators of healthy cities (Sawicki and Flynn, 1996; VanGenderen et al., 1997) and track these trends, objective performance measures as well as more detailed subjective measures will be available to include as dependent measures of infrastructure quality. Lastly, this research examined only one aspect of civic structure—norms of mutual benefit. Other measures of small town civic structure that need to be explored are quantity and quality indicators of town institutions, legal rules, and communication flows and their interactions with community norms of mutual benefit. The empirical work of Flora et al. (1997) suggests that local newspaper reporting bias, citizen opportunity for budget input, rivalry with another community, financial institutional contributions, and horizontal and vertical links will also affect successful rural infrastructure development. Other community-level variables that might be used to represent civic structure in predicting beneficial local outcomes are number of business establishments that are community gathering places (third places) and locally oriented forms of business ownership (Tolbert et al., 2002).

Civic structure has been used in this analysis as an independent variable. There is a need for inquiry into the determinants of civic structure. What types of communities have well-developed civic structures and how did they create them? Is community-level stratification of civic structure merely a reflection of stratification of resources or something else? Answers to these questions have important implications from a development standpoint.

In conclusion, public and private infrastructures are essential to the quality of life that small town citizens experience. Development and maintenance of and satisfaction with these infrastructures are dependent on the investment and consumption practices of citizens (Henderson, Lickerman, and Flynn, 2000). Although public infrastructures are clearly political decisions of the collective whole (either deliberately or by default), the social and political nature of secondary infrastructures is less obvious. The robust effects of civic structure and individual-level social capital on secondary services suggest that the quality of these infrastructures is driven by more than simple supply-demand economics. Thus,
attention to the community organizational structure is important from a development perspective. As small towns face declining services and facilities due to population loss or the need to expand because of rapid growth, investment efforts must extend beyond administrative management strategies and infusions of large sums of money. Investments in strengthening the civic structure should include building a civic norm of pooling resources and working together. Formal and informal opportunities for groups to talk together about community problems and efforts to expand public dialogues beyond the governing elite are strategies to encourage cooperation. The large contribution of civic structure to perceptions of infrastructure quality suggests that it is insufficient for community development practitioners and policymakers to focus only on building individual leadership and organizational skills. Space and resources for multiple groups to act together and cooperate in solving community infrastructure problems are also needed.

Acknowledgments

I would like to thank Cynthia Anderson, Willis Goudy, Thomas Lyson, Vernon Ryan, Yong Wang, and anonymous reviewers for helpful comments and insights on this article.

Notes

1 The hierarchical linear model (HLM) statistical notation follows:

The within-community, individual citizen level model for communities is (perceptions of community services/facilities)$_{ij} = \beta_{0j} + \beta_{1j} \text{ (social capital individual benefit)}_{ij} + \beta_{2j} \text{ (social capital community benefit)}_{ij} + \beta_{3j} \text{ (age)}_{ij} + \beta_{4j} \text{ (length of residency)}_{ij} + \beta_{5j} \text{ (education)}_{ij} + \beta_{6j} \text{ (household income)}_{ij} + e_{ij}$

Where $\beta_{0j}$ is the intercept; $\beta_{1j}$ through $\beta_{6j}$ are sets of coefficients of the individual variables representing social capital individual benefit and social capital community benefit and four demographic variables; and $e_{ij}$ is the unique contribution of each individual $i$ in community $j$. Errors $e_{ij}$ are assumed independent and normally distributed within constant variance $\sigma^2$. Variables are centered on sample means, making $\beta_{0j}$ the mean community perception of services in a town/city after the effects of social capital and individual characteristics are adjusted.

The between-community model can be written:

$\beta_{0j} = \theta_{00} + \theta_{01} \text{ (civic community score)}_{j} + \theta_{02} \text{ (population)}_{j} + \theta_{03} \text{ (mean household income)}_{j} + \theta_{04} \text{ (mean education)}_{j} + \theta_{05} \text{ (mean length of residency)}_{j} + U_{0j}$

Where $\theta_{00}$ is the average perception of town/city services score for the community; $\theta_{01}$ is the regression coefficient for the effect of civic community on the adjusted community perception of services; $\theta_{02}$ through $\theta_{05}$ are the regression coefficients for the effect of control variables population, income, education, age, and length of residency on the adjusted community perception of services; and $U_{0j}$ is the unique contribution of each community—the community effect. The $U_{0j}$s are assumed to be normally distributed with variance $\tau$.

2 The interclass correlation is calculated by dividing the variance between communities by the total variance (between-group variance plus within-group variance).

3 In the model of perceptions of core public services, number of local groups belonged to, social capital private index, and length of residency varied significantly between communities and were considered to have random errors. In the model of perceptions of secondary services, number of local groups belonged to, age, and length of residence significantly varied between communities and were assigned random errors.
References


## APPENDIX A. Proportion of Residents of Rural Towns that Say Service is Available

<table>
<thead>
<tr>
<th>Town Population</th>
<th>Core Public Services</th>
<th>Medical Services</th>
<th>Housing</th>
<th>Childcare</th>
<th>Youth Program</th>
<th>Senior Program</th>
<th>Recreation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990 Census</td>
<td>Streets Water Fire School</td>
<td>51% 85% 62% 67% 72% 79%</td>
<td>96% 91% 97% 93%</td>
<td>94% 93% 93% 94%</td>
<td>96% 90% 70% 80%</td>
<td>96% 91% 70% 80%</td>
<td>96% 90% 87% 73%</td>
</tr>
<tr>
<td>500–999</td>
<td>N = 47</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,000–1,499</td>
<td>N = 15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,500–1,999</td>
<td>N = 13</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2,000–2,499</td>
<td>N = 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2,500–3,000</td>
<td>N = 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3,000+</td>
<td>N = 14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total average</td>
<td>N = 99</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Residents could choose to (1) rate the quality of the service in their town, (2) not respond to the question, or (3) say the service was unavailable.*