Using entrepreneurial social infrastructure to understand smart shrinkage in small towns.

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ABSTRACT Population decline in North America is often viewed as a problem best addressed through economic development efforts promoting growth. In Europe, an alternative view sees depopulation as a process needing to be managed properly, by scaling down community services and infrastructure while maintaining social equity. Called smart shrinkage, this approach argues places can lose population yet still possess a high quality of life. We first clarify the concept by distinguishing the outputs of smartness from its inputs using the entrepreneurial social infrastructure framework. Second, we apply the smart shrinkage concept to *n*=98 small towns in the Midwestern state of Iowa using longitudinal data collected in 1994 and 2014. Shrinkage is measured by faster than average population loss; and smart outcomes by faster than average quality of life gains. We then examine correlates of smart shrinkage using demographic, economic, social capital, and civic engagement indicators. Demographic and geographic factors have little impact on smart shrinkage. Smart towns have stronger local labor markets, lower poverty and inequality, and job opportunities in goods-producing sectors. Lastly, smart shrinking towns exhibit higher social infrastructure by possessing more bridging social capital across diverse groups, greater quantities of linking social capital such as memberships in local organizations, and frequent civic engagement by participation in local projects. These activities are supported by a community culture of openness, tolerance, and support.

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1. Introduction

1.1. Overview and objectives

Rural population decline, along with corresponding economic decline, is a regional problem in most high-income OECD counties. Rural depopulation in North America has been an ongoing trend since the early 20th century, save for places near natural amenities or experiencing economic booms (Johnson, 2014). Rural shrinkage is most severe in the Great Plains and Midwest (Kusmin, 2017). In Europe, rural depopulation has stabilized since the 1990s after waves of out-migration in the decades following the Second World War. However, in certain E.U. countries over 70 percent of rural regions continue to experience depopulation, particularly in eastern Europe and the Baltics (E.U. ESPON, 2017). Recent research suggests the greatest challenges facing shrinking places is first maintaining essential community services; and second retaining investments in businesses and infrastructure (Davoudi and Madanipour, 2015; Meijer and Syssner, 2017; Theide et al., 2017). Depopulation erodes quality of life by curtailing community services and investment, which contributes to further out-migration as residents decide to leave rural communities (Besser, 2013; Jacquet et al., 2017; Molloy et al., 2011).

Most North American social science views rural population loss as a *problem* that needs to be addressed, typically through economic development and neighborhood revitalization efforts to retain current and recruit new residents to grow populations (Rhodes and Russo, 2013). By contrast, some European social science sees depopulation as a *process* that needs to be managed properly, by scaling down local government, community services, and infrastructure to match a smaller population base while still maintaining social equity – collectively termed the smart shrinkage framework (Hospers and Syssner, 2018; Wiechmann and Pallagst, 2012). Although there is no clear definition, smart shrinkage is often described as a process where it is possible

for a place to lose population while still offering high quality of life (Hollander, 2011). This paper applies the smart shrinkage concept from Europe to depopulating small towns in the Midwestern United States to answer three research questions. First, is smart shrinkage adequate conceptually for understanding how small towns effectively adapt and respond to population decline? Second, is the phenomenon of smart shrinkage simply a function of favorable structural conditions like demography, economy, and the providence of location? Third, do smart shrinking towns exhibit greater entrepreneurial social infrastructure?

Our analysis is exploratory and descriptive in nature, thus we make no claims of innovation in theory or method. However, by addressing these questions we can better understand the correlates of smart shrinkage to provide insights on local impacts and responses in rural communities. The idea that shrinking places can also be thriving ones in terms of QoL is novel in the United States, where growth is often equated with development (Hollander, 2011; Shaffer et al., 2004). Most shrink smart research has been done in larger cities, principally in post-industrial Europe but also in a handful of cities in the American Rust Belt (Rhodes and Russo, 2013). There is a paucity of research applying this concept to rural areas in both Europe and the United States (Weaver et al., 2016). This is a particularly troubling gap in the literature given that some of the most severe population losses have been occurring in rural communities and regions on both continents. For many small towns, a strategy of smart shrinkage may be their best option to deal with long-term population decline.

1.2 Conceptual approach

We argue that the current smart shrinkage frameworks in Europe and the United States lack conceptual clarity, which limits their usefulness in understanding how places respond to population change. There is no agreed upon definition of "smart" outcomes, nor of the inputs or

causes of "smartness" that lead to such outcomes. This problem originates with the same tautological errors that hamper the concept of resiliency by confusing the inputs and activities of smartness/resiliency with its outputs and outcomes (Kulig et al., 2013). Put another way, most work fails to distinguish between the causes of smart shrinkage and its effects.

We address this issue by defining *smart outcomes* using subjective quality of life (QoL) assessments. Drawing upon the social indicators literature (Sirgy, 2011), we posit that improved QoL is ultimately the end goal of any project aimed at addressing physical, economic, or social conditions in the community. This is true in both growing and shrinking places. In our work, shrinkage itself is not taken as a problem to be solved, but rather is the given context in which people live that is unlikely to change. Using the entrepreneurial social infrastructure (ESI) framework from sociology, we conceptualize *smart inputs* or activities as purposeful collective actions to achieve community goals that drive smart shrinkage (Flora and Flora, 1993). In defining smartness as purposeful, we exclude economic and geographic factors that may help or hinder smartness, but which are generally beyond the community's control in the near term. Our conceptual model of smart shrinkage is presented in figure 1.

To illustrate, consider the example of fundraising for community improvement projects. In our model, private investment is a smart activity because people must chose to give (purposeful) and the degree of individual giving depends on local norms nurtured or not by the community (local agency). However, private investment is only considered a smart activity if it leads to greater satisfaction with local amenities that contributes to greater community QoL, our smart outcome. If private giving and fundraising only enhances amenities and not QoL, we do not consider it be a smart activity. Activities that do not lead to improved QoL are hypothesized to benefit only a small subset of the community, usually local elites. Further, we do not define

explicitly how smart activities are organized or who implements them. ESI posits that effective community development is the result of many organizations (e.g. private, non-profit, and public) and any single actor.

Figure 1 about here

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2. Literature review

2.1. Smart shrinkage

The definition and utilization of shrinkage, decline, and smart shrinkage have seen a shift in the literature since the latter half of the 20th century. Two concepts are often used to describe communities that are on a downward trajectory: shrinkage and decline. Sometimes the two are used interchangeably, yet the urban studies literature supports a conceptual difference between them. Urban shrinkage is understood as a neutral, meaning value-free, and "empirical phenomenon resulting from the specific interplay of different macro-processes at the local scale" resulting in population loss (Haase et al., 2014). Population loss is considered the most significant measure of urban shrinkage (Pallagst et al., 2014; Reckien and Martinez-Fernandez, 2011; Vujičić and Đukić, 2015), followed by housing abandonment and vacant residential lots (Hollander, 2011), and shrinking household size (Beauregard, 2009). On the other hand, urban decline is a more multidimensional phenomenon which implies a downward trajectory of several indicators including economic performance, labor force numbers, and demographic changes with negative consequences for the affected city or urban region (Hospers and Syssner, 2018; Lang, 2005). Decline can also be viewed as a failure to act. For example, in the European Union, some declining rural regions deny that they are shrinking and therefore do little to ameliorate its negative effects (E.U. ESPON, 2017). Decline has also been conceptualized through the lens of

neighborhood life cycle theory, where decline has occurred through disinvestment in overwhelmingly African American communities. Typical outcomes linked with decline in this context include demographic change, aging of infrastructure and housing, and conversion of property from single family owner-occupied to rental housing (Metzger, 2000).

In our research, we conceptualize population shrinkage as one symptom of decline that neither disparages nor compliments a community as a metric on its own. Our project shows that not all shrinkage is decline, nor are all efforts to manage shrinkage necessarily smart. Rightsizing or planned shrinkage is one way that smart shrinkage is referred to in the literature (Ryan, 2012). In this framework, communities have opportunities to make smart decisions in the midst of the population loss, which may mitigate its negative effects on quality of life. Implementation is challenging, because population loss inevitably limits the provision of health, social, and public services (Hospers, 2013). Despite this, Hollander (2011) finds that people in shrinking communities can still experience high quality of life when it is measured by residents' perceptions. Hence, smart shrinkage is proposed as a paradigm shift in responding to depopulation by re-configuring the community to be smaller and more sustainable, rather than responding with typical economic growth strategies (E.U. ESPON, 2017).

Despite a plethora of empirical and case studies on the topic, smart shrinkage is still not well conceptualized. Our review of the literature finds only one paper that provides a theoretical grounding for smart shrinkage. Hollander and Németh (2011) develop a normative theory of smart decline that views shrink-smart strategies through a social justice lens. They propose a theoretical framework to define smart shrink processes for local stakeholders to ensure government planning strategies adhere to the principles of social justice. First, shrink-smart strategies should accommodate and acknowledge diverse voices. Second, those processes should

have capacities for democratic public participation and effective negotiation in order to reach consensus-based strategies. Third, planners should utilize a variety of communication techniques to best understand the needs of the whole community. Fourth, shrink-smart planning processes should be open, honest, and transparent to residents. Additionally, planning efforts should be regional in scope, yet local in their control and flexible in their implementation.

Research on shrinkage and decline has focused primarily on larger post-industrial cities that have experienced population loss concurrent with losses of jobs and investment in the industrial economy. Cities such as Detroit, St. Louis, and Youngstown, Ohio feature prominently in the American case study literature (Dewar and Thomas, 2012; Gordon, 2009; Safford, 2009). A continent away the cities of Glasgow, Leipzig, Liverpool, and the Czech city of Ostrava play similar roles in the research literature on European cities (Bernt et al., 2012; Hospers, 2014; Zarecor, 2012). While there is a wide array of research on the causes and responses to rural depopulation in general, very few studies have specifically used the concept of smart shrinkage to understand how some communities have successfully adapted to smaller populations. Our review of the literature finds only one peer-reviewed paper on smart shrinkage in small towns. Bowns (2013) argues that smart shrinkage ought to be applied to towns as well as cities, since towns serve as "urban centers" for the surrounding countryside. She also argues the underlying processes driving urban and rural smart shrinkage are the same. Using a case study of three small towns in Pennsylvania, Bowns finds common threads in how these places have responded to shrinkage. First, they have strong narratives about their community and region that provide both a shared vision for residents and permits an on-going dialogue about the future. Such narratives are built around intertwined local history, culture, and landscapes. Second, towns are using their cultural and natural assets to imagine smaller local economies. The goal is not growth, but a

sustainable economic model both environmentally and demographically. Lastly, she finds that inter-regional collaboration is essential to establish long-term plans that have a high probability of being implemented.

2.2. Quality of life

The smart shrinkage framework is not explicit in how to measure smartness. To address this gap, we use subjective ratings of community quality of life (QoL) as indicators of smart outcomes that have been used in other smart shrink research (Hollander, 2011). Improved QoL is often used as a benchmark to judge whether community projects have been successful in the opinion of residents (Grzeskowiak et al., 2003). Whether creating jobs, improving education, or building health facilities, the major purpose is to improve the lives of residents in both an absolute and relative sense. Subjective QoL indicators measure attitudes, feelings, and satisfaction with the assets in a place. We choose subjective indicators because we are interested in relative QoL assessments that differ across people and places. By contrast, objective indicators measure the actual properties of a place, and typically require a single external criterion to judge quality (Sirgy et al., 2000). It is our contention that subjective assessments by residents in the community matter more in understanding the quality of peoples' lives in a place than assessments done by outsiders. Subjective and objective indicators may contradict each other. For example, local schools may outperform other schools on statewide tests, but residents may feel their schools could do better at educating their children.

This study uses the personal utility model of community QoL outlined by Sirgy (2011), which posits QoL in a place is derived from subjective ratings about the person and the place along three community services dimensions measuring personal utility. The *business dimension* rates the employment, commercial, entertainment, and telecommunications aspects of the

community. The *non-profit dimension* assesses healthcare, social services, recreation, religious, and civic venues. Lastly, the *government dimension* is how people view public safety, public utilities, transportation infrastructure, public schools, and other government services. Previous research has established that satisfaction with community services is a robust measure of overall community QoL (Boncinelli et al., 2015; Potter et al., 2012).

2.3. Entrepreneurial social infrastructure

Since quality of life is used to measure the outcomes of smartness, we also need a conceptual model to understand the causes or inputs of smartness that are distinct from the outcomes. Again, the smart shrinkage concept is not clear on what drives smartness. We use the entrepreneurial social infrastructure (ESI) framework to address this conceptual weakness. ESI describes the characteristics of a community's social structure that facilitates or impedes collective actions to achieve some goal, which ultimately leads to improved QoL (Flora and Flora, 1993). The term entrepreneurial implies that actions to achieve common goals are purposeful and innovative in the community. Over the past 20 years, ESI has been widely used to understand why some rural communities have been effective at locally led economic development efforts and why others have failed (see Flora et al., 1997; Sharp et al., 2002; Sharp and Flora, 1999).

Flora and Flora (1993) outline the three main dimensions of ESI: legitimacy of alternatives, resource mobilization, and network quality. Legitimacy of alternatives encompasses shared symbols and norms of behavior that promote collective action, which are created and reinforced by social interactions. It is measured using four indicators. *Low density of acquaintance* enhances ESI by promoting interactions among residents who are dissimilar from each other that prevent social and physical segregation in the community; and is similar to low

bonding social capital. Bonding ties are relationships between people who are similar in some manner, typically based on strong affective ties that make them emotionally close (Ferlander, 2007). *Acceptance of controversy* is the ability of the community to accept differences of opinion and alternative courses of action, so all options are considered. *Depersonalization of politics* is where public positions on issues are decoupled from moral judgements, allowing open discussion of controversial issues. *Focus on process* helps collective action by viewing the means of addressing community issues as more important than whether the project was a success or failure.

The first indicator of resource mobilization is *equal distribution of resources*, typically viewed as low income inequality. Inequality hinders ESI since the wealthy typically participate in community projects to maintain their privileged positions, while the poor see no personal benefit to their participation. *Private individual investment* is the ability of residents to contribute private resources (their money, time, and social connections) to community projects in which they will not directly benefit, or that the benefits will be shared among all residents. *Public collective investment* is the degree to which the community contributes public resources to projects, typically through local government. This includes raising sufficient taxes for government operations, passing of infrastructure bonds, serving on local boards and commissions, and volunteering in non-profit or quasi-public organizations (e.g. fire protection).

Lastly, network quality promotes ESI through building diverse and robust social networks that facilitate identification of relevant community needs, raising of resources to implement projects, and commitments to support projects long-term. *Diverse and inclusive networks* cut across major divides in the community such as race and ethnicity, gender and age, social class, and new versus long-time residents. This broadens the community's resource base

and promotes greater civic engagement from all residents. This is similar to bridging social capital or ties between dissimilar people that is outward looking and seeks to connect different groups (Ferlander, 2007). *Strong horizontal networks* are linkages between residents in the community that occur through local organizations and clubs, which is analogous to internal linking social capital (Dahl and Malmberg-Heimonen, 2010). *Strong vertical networks* are linkages between the community and state, regional, and national organizations; and this concept is similar to external linking social capital (Rubin, 2016).

3. Data and Methods

Data for this analysis is drawn from the U.S. Census and the Iowa Small Towns Project (ISTP). The ISTP is a longitudinal survey of residents in 98 small towns in Iowa conducted in 1994 and 2014. Small towns are defined as municipalities not adjacent to a metropolitan city (50,000 or more) that had populations between 500 and 10,000 people in 1990. This follows U.S. Census Bureau definitions of urban centers with metropolitans having 50,000 or more people, micropolitans between 10,000 and under 50,000, and finally non-core or rural places representing small cities and towns below 10,000 people. A two-stage sampling design is employed, first randomly selecting one small town for each of Iowa's counties; and second randomly selecting 150 housing units within each selected town.[1] The response rate (*RR3*) is 72.7 percent (n=10,796 respondents) in 1994 and 41.5 percent (n=6,163) in 2014, with the latter being similar to U.S. Census Bureau's (2014) mailed response rate of 48 percent to the American Community Survey. In each wave the sampled communities are representative of all Iowa towns meeting our criteria, based on decennial Census data (Besser et al., 2015). Secondary data for sampled small towns are place estimates obtained from the 1990 Decennial Census and the 2008-2012 American Community Survey (ACS). The 2008-2012 ACS (hereafter 2010) is chosen

because its mid-point of 2010 provides some comparability with 1990 figures. ACS response rates are about 97 percent using mailed surveys plus telephone and in-person interviews.

We operationalize the smart shrinkage concept by using percent change in population between 1990 and 2010 to measure shrinkage; and change in community quality of life (QoL) between 1994 and 2014 to measure smartness. We construct the smart shrinkage typology by assigning the n=98 towns into four discrete categories based on z-scores of the two indicators, excluding towns within 1.0 standard deviation around the mean. Higher thresholds of 1.5 and 2.0 deviations around the mean results in too few cases for analysis. *Smart shrinking* towns are those with above average declines in population, yet above average gains in community QoL. *Declining* towns are those with above average losses in both population and QoL. For comparison, *thriving* towns have growth in both population and QoL, while *adverse growing* places saw worsening QoL despite population gains. To address our research questions that seek to describe smart shrinking towns across socioeconomic dimensions and entrepreneurial social infrastructure, a multivariate general linear model (traditionally MANCOVA) is used to explore mean differences across categories of the smart shrinkage typology. Differences between estimated marginal means holding 2010 population constant is assessed using the Games-Howell test, which is robust to unequal group sizes and variances (Cohen et al., 2003).

Community QoL is an index averaging the ratings of seven items: the quality of jobs, medical services, public schools, housing, local government services, child care services, and senior services. The 2014 index has a Guttman reliability lower bound of λ_2=0.820 (0.779 in 1994) that accounts for covariance heterogeneity; and an internal consistency of λ_3/α=0.841 (0.777 in 1994) that is equivalent to Cronbach's measure (Tabachnick and Fidell, 2012). The QoL index is calculated using simple averaging instead of a formal measurement model like

exploratory factor analysis (EFA) for consistency across indices and time. EFA results verify that the seven components of QoL belong to a common factor.[2] *Entrepreneurial social infrastructure* is operationalized using indicators of bonding and bridging social capital, memberships in groups for linking social capital, measures of civic engagement, and perceptions about the community. All items are on Likert scales ranging from five to seven points, which are converted to a 100-point scale for comparability. *Structural factors* including demographics, employment, income, and housing are from Census and ACS. Refer to the on-line appendix for detailed variable definitions.

4. Results and Discussion

4.1. Identifying smart shrinkage towns

The scatterplot of small towns along population and quality of life (QoL) change is presented in figure 2, from which we identify towns that are shrinking smartly or declining in terms of population and QoL. In the smart shrinkage literature, population loss is the standard measure of shrinkage (Haase et al., 2014); and quality of life has been used to measure smartness in a handful of urban settings (Hollander, 2011). We find n=11 smart shrinking towns who experienced on average a -10.9 percent drop in population, yet gained an average of 11.3 points on QoL ratings (on a 100 point scale) over the past 20 years. By contrast, the n=9 declining towns saw worsening QoL (-3.5 point drop) despite having a similar statistical rate of depopulation (-12.9% loss). Smart shrinking towns have higher and improving scores on almost all dimensions of QoL compared to declining and adverse growing towns, especially with regard to jobs, medical care, and child and senior services. However, thriving towns (growing population and QoL) score higher than smart ones on most QoL metrics, save for medical care. Inspection of the maps in figure 3 reveal no clear geographic clustering of smart or declining

towns across the state. Smart shrinkage places are not proximate to one another, suggesting spatial and regional factors play a minimal role.

Figure 2 about here

Figure 3 about here

4.2. Smart shrinkage and economic and physical infrastructure

Although demographic and economic conditions are not considered to be part of entrepreneurial social infrastructure (ESI), such structural factors provide important context on the conditions that may help or hinder development of ESI and quality of life, which we argue leads to improved QoL. Although table 1 shows few demographic differences, we find that smart shrinking towns are much smaller in terms of population and municipal area compared to declining and both sets of growing towns (700 vs. around 1,000 people per square mile). Smart towns also have fewer and slower growing numbers of single-headed families with children, which typically correlates with lower child poverty and better child well-being outcomes (Pender et al., 2014). Although there are no statistical differences in base age structure, we do observe an aging population over time in smart shrinking towns with growing shares of elders over 65 years of age (1.7 vs. -1.3 points). This suggests growing numbers of elders may enhance QoL as this group has the time, financial resources, and experience to support improvement projects (Peters et al., 2017). Growing towns, both adverse and thriving, have better educated populations than both sets of shrinking ones.

Reinforcing the lack of spatial clustering found on the maps in figure 2, we find minimal geographic differences. Smart shrinking and declining towns have the same access to primary

roads and the same lack of natural amenities. By contrast, adverse growing and thriving places are more connected to transport networks and have some natural amenities. The only difference is that smart towns tend to be located in counties that are more rural with smaller urban centers (scoring a 6.9 of 9 indicating location in a county with an urban population between 2,500 and 19,999). However, declining places are in counties that became more rural and less urban since the 1990s. Overall, both sets of shrinking towns are becoming more geographically isolated from urban centers. This indicates smart shrinkage is less influenced by metropolitan proximity, meaning QoL gains are unlikely to be driven by greater access to urban amenities (Grzeskowiak et al., 2003).

Table 1 about here

In terms of economics, we find that smart shrinking towns have a number features that distinguish them from declining and even adverse growing places (see table 2). Smart shrinking towns have a strong job market as evidenced by higher labor force participation rates (45.6 vs. 42.9%), more workers employed in full-time and full-year jobs (55.2 vs. 50.1%), and shorter commuting times (19.6 vs. 25.4 minutes) than declining places. In addition, employment participation rates grew faster while commuting times barely changed since 1990, indicating more local job creation. Smart towns outperform adverse growing places on these measures, but lag behind thriving towns. Median incomes are statistically identical for all groups except for thriving towns, where incomes are higher and growing. However, poverty in smart shrinking towns is low (12.6 vs. 16.6%) and rates have not ticked upward over the past two decades (-0.3 drop vs. 3.8 gain) compared to declining and even adverse growing places.

For the most part, residents in all shrinking towns work in the same types of jobs except for two marked differences. Smart towns have much larger shares of residents employed in goods-producing industries like manufacturing and construction (32.4 vs. 26.3%); and counter to state and national trends the share of these jobs actually increased since the 1990s (6.5 vs. no gain). Rates in smart towns even outpaced those in adverse and thriving growth towns. On the other hand, smart shrinking towns have fewer jobs in retail trade and leisure services like entertainment, accommodation, food, and personal services (21.9 vs. 25.1%). These services jobs grew in declining and adverse growing places, but fell in smart ones. It is clear that blue-collar jobs in local goods-producing firms helps quality of life in shrinking towns, while lower-end services jobs hinders it.

Table 2 about here

4.3. Smart shrinkage and entrepreneurial social infrastructure

The focus of our paper is to understand whether smart shrinking towns possess higher levels of entrepreneurial social infrastructure. We hypothesize that growing quality of life (smart outcomes) is driven by purposeful collective actions facilitated by ESI norms of openness and inclusion, mobilization of resources, and strong social networks (all smart inputs). We test this hypothesis using social capital and civic engagement indicators from the ISTP, presented in table 3. It is important to keep in mind we are examining the correlates of smartness on average, and not individual towns or specific strategies. The first dimension of ESI is legitimacy of alternatives, defined as community symbols and norms that promote collective action. We find smart shrinking towns score higher on *accepting controversy and depersonalizing politics*, as measured by bonding social capital indicators of trust and support in the community. Residents

in smart places see their towns as more trusting versus not trusting (71.0 vs. 64.8); and more supportive versus indifferent of others (72.3 vs. 66.9) compared to declining towns. In addition, smart towns became more trusting and supportive since 1994, while declining places became less so. A *focus on process* is also a feature of smart shrinkage with such towns being more open to new ideas rather than rejecting them (60.6 vs. 53.4); and this openness to ideas became stronger over time (3.7 point gain vs. -3.8 point drop). Residents in smart towns also feel they are more involved in local decision-making (64.2 vs. 60.9); and although the rate declined over time it was slower than in declining towns (-8.1 vs. -11.1 point fall). By contrast, thriving towns score higher on these indicators while adverse growing towns generally score lower.

Counter to ESI, we find that smart shrinking towns do not have a *low density of acquaintance*. People in both shrinking and growing towns have the same number of relatives and in-laws living in their communities; and smart shrinking places tend to have more close friends in the community compared to declining ones (49.8 vs. 47.1 in 2014, with a slower drop of -4.2 vs. -7.2 points). According to ESI, we expect to find much lower scores on these measures of bonding social capital in smart shrinking and thriving towns. Stronger bonding ties have previously been found to promote localism, bullying, mistrust of outsiders, and resistance to new ideas that suppresses collection actions and results in lower quality of life (Poortinga, 2012). However, our finding do not confirm previous research.

Improving quality of life is also contingent on the community's ability to mobilize resources (such as fundraising, volunteers, social connections, or specialized skills) for improvement projects, the second dimension of ESI. Flora and Flora (1993) make the case that *equal distribution of resources* is a precondition for effective mobilization, drawing in the poor as well as the wealthy. In table 1, we see the poorest 20 percent of households in smart shrinking

places own a slightly larger share of community income than in declining ones (5.0% vs. 4.6%). While income shares fell for both groups over time, the poor become much poorer in declining (-16.8% drop) than in smart (-6.6% drop) places. Further, poverty rates in smart towns have been low and stable since the 1990s, while in declining places poverty is high and growing. For comparison, inequality and poverty is low in thriving places, while adverse growing places have higher inequality far above what we see in smart shrinking towns. This is consistent with the inequality literature that finds lower income polarization linked to better socioeconomic and quality of life outcomes (Gornick and Jäntti, 2013).

Smart shrinking places engage in greater *private individual investment*. Over half (50.1%) of residents in smart shrinking places gave money or volunteered in a community improvement project, compared to just over two-fifths in declining, adverse growing, and thriving places. Greater private investment in housing is indicated by higher valued owner-occupied homes in smart versus declining towns ($77,560 vs. $65,880). Indirectly, private investment in the community is also indicated by residents viewing their town as much better kept-up (71.5), scoring higher than declining (58.8 with a -9.1 point drop) and even adverse growing (65.5 with a -4.7 point drop) towns. On the other hand, thriving towns score higher on this measure.

Public collective investment can be indirectly measured through community perceptions. Safety is an indicator of adequate law enforcement, courts, fire protection, and building code enforcement provided by local government through taxes and staffing. Residents in smart shrinking places feel safer in their towns, while those in declining ones feel slightly less safe (82.1 vs. 76.8). Another indicator of public collective investment is whether residents feel the entire town gets behind and supports community projects. We find more support for community

projects in smart versus declines places (58.6 vs. 50.1). The ESI literature also argues that collective investment is a function of confidence in the future (Sharp et al., 2002). Residents will invest in the community if they think its prospects look good in the future, and conversely will disinvest if they think the town will only continue to shrink and wither. We find that people in smart shrinking places think their town has much more going for it than other similar towns (66.8), and this confidence has increased over the past 20 years (1.8 point gain). Smart towns are even more confident that adverse growing places. By contrast, declining towns have less confidence in their communities that has eroded over time (48.9 with a -8.7 point drop). This is a nearly 18 point gap in confidence between smart and declining towns, the largest in our set of social indicators.

The last dimension of ESI is quality networks that are diverse, inclusive, and extensive. It is clear from our data that smart shrinking towns have more *diverse and inclusive networks*. People in smart places agree more than those in declining towns that organizations in the community work for the best interests of all residents (62.6 vs. 57.2); and that the community is open to new residents taking leadership positions (51.5 vs. 46.7). Although ratings have fallen in smart shrinking towns since 1994, the declines are slower than in declining places. Smart towns are also more tolerant versus prejudiced of others in the community compared to declining places (66.8 vs. 63.0). However, smart shrinking communities are no more accepting of racial and ethnic minorities, contrary to what the ESI framework predicts. This suggests tolerance of non-minority residents across non-racial lines (e.g. class or gender), but less tolerance of minorities themselves. Overall, thriving towns score higher on measures of diverse and inclusive networks; and both sets of growing towns are more accepting of different races, likely due to increased minority populations.

The extensiveness of networks is also important for network quality, measured here by memberships in formal clubs and organizations. *Strong horizontal networks* are those within the community and is similar to internal linking social capital. On average, each resident in a smart shrinking town is a member of 1.2 local organizations, while in declining towns the number is 1.1 per person – a small yet statistically significant difference. Specifically, we find smart towns have higher memberships in recreational clubs (1.7 vs. 1.4 per person), job-related groups like unions and professional associations (1.3 vs. 1.1 per person), and political and civic groups including school associations, historical societies, local development organizations, and community improvement clubs (1.4 vs. 1.3 per person). There is no statistical difference in memberships in service or fraternal organizations. Job-related groups are probably linked to the relatively large goods-producing sector in smart towns, likely advocating for better employment options for their members and the community at-large. Civic groups are key organizers of projects to address a wide range of issues in the community. However, horizontal networks have declined in both sets of shrinking places and in small towns overall, as younger and middle age residents eschew formal organizations (Sunblad and Sapp, 2011). *Strong vertical networks* are those connecting the community to state and national organizations that have formal power, again analogous to external linking social capital. We find residents in smart towns have slightly more memberships in outside organizations compared to declining places (0.80 vs. 0.70 per person). In short, strong intra-community linkages are a critical piece of social infrastructure that helps shrinking towns improve quality of life.

Table 3 about here

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5. Conclusion

In this paper, we use a modified version of the smart shrinkage framework to understand why some small towns in the American Midwest have improved perceptions of quality of life in their community despite population losses. In response to our first research question, we find the smart shrinkage framework to be wanting in terms of conceptual clarity on the outcomes of smartness as well as the activities and inputs that are theorized to drive smartness. The literature tends to treat the causes and effects of smartness as one in the same. To address this issue, we advocate smart outcomes be measured using subjective quality of life assessments along three dimensions of the personal utility model, where community services and amenities are provided by the business, non-profit, and government sectors. We also advocate that the activities and inputs that cause smart outcomes be measured separately from QoL using the entrepreneurial social infrastructure (ESI) framework. ESI assumes that collective actions to achieve community goals are purposeful and innovative. We view our clarifications as a starting point in a larger conceptual discussion of the smart shrinkage framework. We acknowledge there may be competing models to operationalize smart shrinkage, notably the resiliency framework. We also recognize the many variations in how to think about and measure ESI and social capital more broadly. However, our paper is unique in proposing a more defined conceptual model that is tested using longitudinal data from a sample of small towns in the Midwestern United States.

Concerning the second research question, we find smart shrinkage is not solely attributable to demographic and geographic factors that are generally fixed in the near term. For the most part, smart shrinking and declining towns are nearly identical in terms of demographics, infrastructure, and natural amenities. Counter to what we expected, smart shrinking towns are located in more rural counties distant from population and employment centers. This suggests isolation from larger cities strengthens local ESI, while proximity to such cities creates

dependence that inhibits local action. For example, towns must provide for their own medical care as these services cannot be easily obtained in a nearby city. The same for economics, where isolated towns must create local job opportunities because commutes to employment centers are too long and costly. This isolation is both cause and consequence of poor connectivity to transportation networks.

On the other hand, we find a number of economic factors correlating with smart shrinkage. Smart towns have strong local labor markets, lower poverty, and an expanding goods-producing sector despite contractions at the state and national level. By contrast, there is a noticeable lack of such jobs in declining towns, which instead specialize in retail and leisure services jobs. According to regulation theory (Kumar, 2005), goods-producing jobs characteristic of the Fordist industrial economy are thought to enhance quality of life by typically providing middle-wage jobs, full-time and full-year work, health and retirement benefits, and require some education beyond high school (U.S. BLS, 2017). Such jobs provide economic opportunities to low and moderate income people, resulting in lower poverty and better socioeconomic outcomes (Peters, 2013). Conversely, retail and leisure services jobs linked to the post-Fordist services economy require minimal skills, pay lower wages with few if any benefits, and the work is contingent and part-time (Peters, 2012). We find no difference in professional services jobs across all towns whether shrinking or growing, indicating the new post-Fordist economy has created many low-end services jobs in small towns but none of the high-skill and high-wage ones often associated with the 21st century economy. Although the Fordist period has largely passed, vestiges of it still exist in some communities, as it appears to be in smart shrinking small towns in Iowa.

For the last question, we find evidence that smart shrinking places have greater community agency by exhibiting more civic engagement and stronger social networks, which is posited to drive quality of life according to the ESI framework. Our analysis finds residents in smart places tend to rate their towns as more trusting, supportive, and tolerant (versus mistrusting, indifferent, and prejudiced), indicating they are more likely to accept controversy and depersonalize politics on divisive issues. More focus on process is evidenced by more people saying their town is more open to new ideas and more open to residents being involved in decision-making. There is greater private investment with half the population participating in community projects, higher home values, and more residents viewing their town as well kept up. Public investment is also higher with residents in smart towns saying their community is very safe, that the whole town gets behind community projects, and that their town has more going for it than other places. All of these indicate a willingness of the community to invest in itself. Smart shrinking towns also have fairly inclusive and diverse networks, with strong bridging social capital indicated by the view that local organizations work on behalf of all residents, and that new residents are accepted as leaders. Horizontal or within community networks are also stronger with residents being members of more local clubs and organizations, especially those related to employment or civic groups. However, smart and declining towns are similar in terms of vertical networks; and are not inclined to accept people from different races and ethnicities. Counter to ESI, we find that smart towns have strong bonding social ties, which typically results in traditional and insular communities that have low ESI and poorer QoL. In conclusion, we find that smart shrinkage is primarily driven by social infrastructure, and less by economic and physical infrastructure. If we were to summarize the key difference between smart and declining places, it would be confidence in the future.

There are several limitations of our work that should be addressed in future research on smart shrinkage. First, there may be selection bias in our quality of life data between 1994 and 2014, as dissatisfied residents leave and satisfied ones stay that may artificially increase QoL ratings over time. However, not all shrinking towns have growing QoL, as one would expect if this bias were present. Many towns have drops in both population and QoL, indicating selection bias may not be a major issue. Second, our findings are based on a sample of towns in a single Midwestern state. More research is needed in other regions of the United States and in other developed nations to determine whether findings are consistent across various economic, cultural, and political contexts. Third, we present the correlates of smart shrinkage and not its potential causes. Future research should more rigorously examine causal linkages between smart inputs and outcomes in depopulating rural regions. Fourth, future work should also seek to develop a more comprehensive conceptual model of smart shrinkage that expands ESI to include spatial, physical, and historical factors. Lastly, this paper does not discuss specific strategies of smart shrinkage that can be used to guide local actions. An important next step is to identify and describe common activities and projects undertaken by shrinking places to improve quality of life, which can be replicated by designers, planners, and community developers in other shrinking small towns.

Acknowledgements

See cover letter.

Endnotes

1 Housing unit addresses were selected by telephone exchanges in 1994 and ZIP codes in 2014. Only 98 communities are used for analysis since one town selected in 1994 was

replaced in 2014 due to a sampling error by the research team. Design weights are used in some communities to correct for over-sampling of key sub-populations to ensure representativeness.

2 The QoL index is calculated using simple averaging instead of a formal measurement model for several reasons. First, we wanted to create a robust index of QoL where each indicator contributes equally. Measurement models estimate differential weights that amplify scores on a few indicators while diminishing other scores. Second, it is difficult to compare factor scores across time as the loadings and means differ in each year. Factor scores are essentially *z*-scores making them relative measures within a wave rather than absolute measures across waves.

To verify the QoL index, exploratory factor analysis (EFA) using principal components extraction finds two factors accounting for 81.4% of the variance in 2014 and 74.3% in 1994. The first factor includes jobs, medical, child care, and senior services; and the second public schools, housing, and local government. However, the second factor accounts for a small share of the variance as the three indicators have sizable cross-loadings on the first factor. Forcing a single factor reduces explained variance down to 66.7% in 2014 and 58.9% in 1994. We decided to sacrifice about 15% of variance by combining all seven items into a single QoL index to be consistent with previous research.

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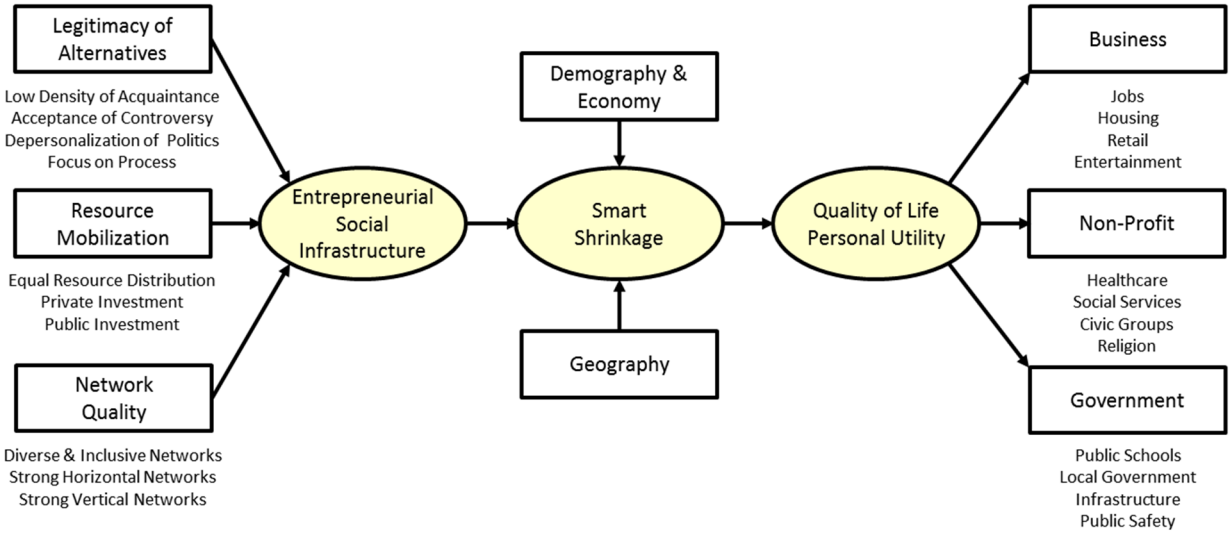

Fig. 1. Conceptual model of smart shrinkage using entrepreneurial social infrastructure and the personal utility model of quality of life. Ellipses represent latent concepts and rectangles observed indicators.

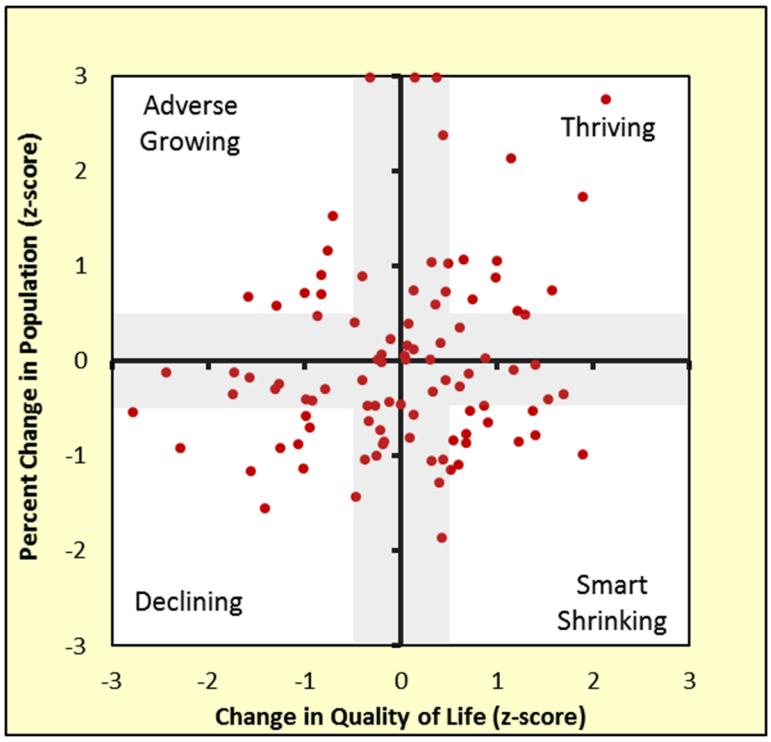

Fig. 2. Plot of standardized change in population (1990 and 2010) and quality of life (1994 and 2014) for *n*=98 small towns in Iowa. Gray bars represent 1 standard deviation around the mean.

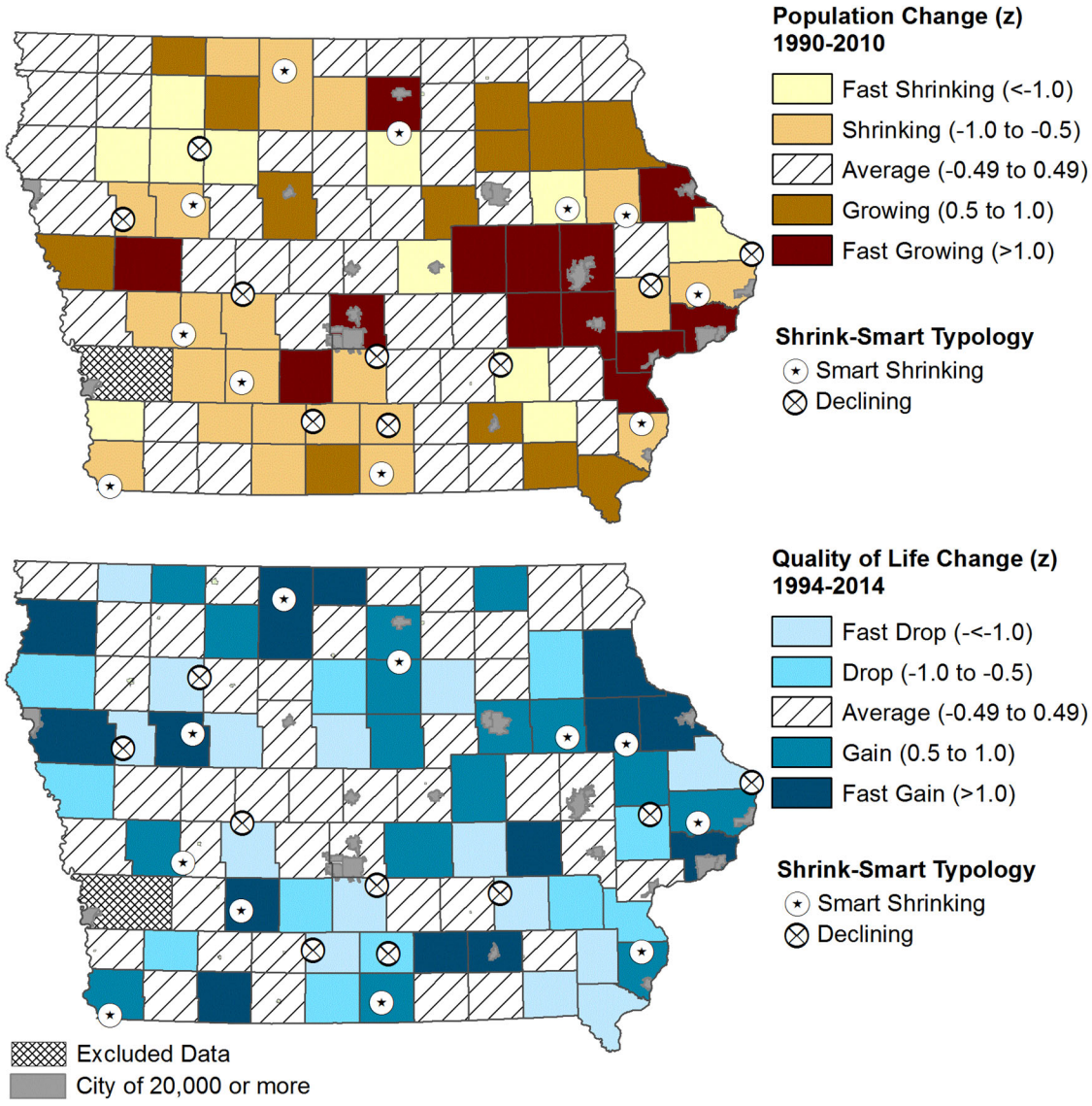

Fig. 3. Map of standardized change in population (1990-2010) and quality of life (1994-2014) for *n*=98 small towns in Iowa. Symbols represent towns in the smart shrinkage typology.

Table 1.

Mean difference tests of demographic and spatial indicators by the smart shrinkage typology for *n*=98 small towns in Iowa.

	Base in 2010				Change from 1990			
	Smart Shrinking (n=11)	*Declining (n=9)*	*Adverse Growing (n=7)*	*Thriving (n=10)*	*Smart Shrinking (n=11)*	*Declining (n=9)*	*Adverse Growing (n=7)*	*Thriving (n=10)*
Demographics								
Population (#)[ab]	917	1,062	1,361	2,337***	-10.85	-12.89	21.15***	27.88***
Population Density (sq.mi.)[a]	725	1,052***	1,082***	1,006***	-87.63	-161.44***	186.41***	213.48***
Minorities	6.36	3.99	12.30*	5.00	5.20	3.00	9.43†	4.37
Age 17 & Under	23.01	23.65	24.74	23.30	-3.28	-1.18	0.48**	-1.65
Age 65 & Older	24.17	21.69	17.68***	18.97***	1.73	-1.28**	-4.28***	-2.69***
Single-Headed Families with Children	28.54	37.03**	30.89	25.52	11.34	17.30†	17.43†	6.76
High School Non-Completers	12.98	13.70	14.31	7.48***	-11.16	-11.98	-9.43	-16.65***
4-Year College Graduates	13.64	10.91	19.45**	22.15***	3.89	1.66	7.38*	10.81***
Geographic (county)								
Urban to Rural Continuum Code (1-9)	6.90	5.72*	6.44	5.46**	0.05	0.75*	0.57	0.27
Highway Density 5 mi Radius (sq.mi.*10)	1.68	1.99	2.40***	2.36**	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Topographic Variation (1-21)	7.96	9.15	9.15	7.71	*n.a.*	*n.a.*	*n.a.*	*n.a.*
Water Area (%)	0.69	0.55	1.44*	1.54**	*n.a.*	*n.a.*	*n.a.*	*n.a.*

Notes: Values reported as percentages except where noted. Different from Smart Shrinking places at †$p<0.10$, *$p<0.05$, **$p<0.01$, ***$p<0.001$ using Games-Howell Test. *a* actual mean. *b* percent change. Population constant 1,420.

Table 2.

Mean difference tests of economic and housing indicators by the smart shrinkage typology for *n*=98 small towns in Iowa.

	Base in 2010				Change from 1990			
	Smart Shrinking (n=11)	*Declining (n=9)*	*Adverse Growing (n=7)*	*Thriving (n=10)*	*Smart Shrinking (n=11)*	*Declining (n=9)*	*Adverse Growing (n=7)*	*Thriving (n=10)*
Employment								
Employment Participation	45.76	42.89**	45.71	52.89***	2.56	0.44	0.55	7.17***
Full-Time & Full-Year Jobs	55.15	50.12**	48.40***	60.12**	4.16	-3.44***	-3.76***	6.79
Average Travel Time to Work (mins)	19.63	25.44***	22.43**	20.79	0.99	4.67***	3.41*	1.63
Agriculture & Natural Resources	4.56	4.96	4.07	3.13	-4.26	-3.60	-4.47	-5.79
Manuf., Const. & Mining	32.43	26.26*	21.53***	27.17*	6.51	0.04**	-3.19***	2.03†
Transport, Telecomm & Utilities	8.57	7.43	7.56	6.24**	1.31	1.58	2.08	0.79
Prof. Srvs., Finance & Real Estate	5.67	5.41	7.81†	6.62	-3.45	-4.68	-2.93	-4.26
Health, Social & Education Srvs.	21.10	23.31	26.19*	25.93*	2.28	6.11**	5.42*	7.78***
Retail Trade & Leisure Srvs.	21.85	25.05*	27.68***	23.76	-0.38	2.49*	5.31***	0.35
Income								
Median Household Income (2010$)[a]	$40,729	$39,890	$42,066	$52,664***	20.28	15.56	21.68	40.89***
Poverty	12.62	16.57**	15.53†	7.00***	-0.34	3.83**	2.79*	-2.69
Income Owned by Bottom 20%[a]	5.02	4.58†	4.24**	5.95***	-6.55	-16.84†	-26.02***	9.75**
Income Owned by Top 20%[a]	42.60	43.34	43.94	41.13	1.15	4.91	4.74	-3.29
Housing								
Occupied Housing Units	89.44	89.73	90.28	90.37	-3.24	-2.89	-0.95	-2.42
Median Home Value (2010$)[a]	$77,559	$65,875*	$82,694	112,683***	55.07	47.44	42.03	90.69***

Notes: Values reported as percentages except where noted. Different from Smart Shrinking places at †$p<0.10$, *$p<0.05$, **$p<0.01$, ***$p<0.001$ using Games-Howell Test. *a* percent change. Population constant 1,420.

Table 3.

Mean difference tests of quality of life, social capital, and community perception indicators by the smart shrinkage typology for *n*=98 small towns in Iowa.

	Base in 2014				Change from 1994			
	Smart Shrinking (n=11)	*Declining (n=9)*	*Adverse Growing (n=7)*	*Thriving (n=10)*	*Smart Shrinking (n=11)*	*Declining (n=9)*	*Adverse Growing (n=7)*	*Thriving (n=10)*
Quality of Life								
Quality of Life Index[a]	57.71	41.61***	46.80***	60.20	11.32	-3.54***	-0.63***	12.67
Social Capital								
Bonding – Close Friends in Town	49.83	47.06†	47.19	46.00*	-4.24	-7.21***	-6.33*	-3.79
Bonding – Relatives/In-Laws in Town	36.33	37.68	34.94	34.13	-5.02	-2.91*	-3.50	-2.94*
Bonding – Not Trusting v. Trusting	70.97	64.77***	68.49	75.60**	2.34	-4.08***	1.16	3.07
Bonding – Indifferent v. Supportive	72.26	66.88***	68.45**	75.37*	6.81	1.46***	3.36**	6.38
Bridging – Organizations Work for All	62.61	57.23***	58.84**	64.75	-6.08	-11.06***	-8.31	-5.37
Bridging – New Residents as Leaders	51.50	46.66***	49.68	57.66***	-6.08	-9.02*	-6.38	0.13***
Bridging – Prejudiced v. Tolerant	66.75	63.03***	65.02	72.01***	12.19	7.42***	8.01**	14.62
Bridging – Reject v. Open to New Ideas	60.64	53.35***	57.60	65.86***	3.73	-3.83***	1.43	8.59***
Linking – External Organizations (#)	0.80	0.70*	0.82	0.86	0.02	-0.06	-0.08	-0.03
Linking – Internal Organizations (#)	1.21	1.05*	1.14	1.08	-0.53	-0.55	-0.55	-0.52
Civic Engagement								
Participated in a Project Last Year (%)	50.13	43.14*	40.92**	40.65**	-0.34	-2.64	-7.65*	-5.49
Community Support for Projects	58.61	50.06***	53.77**	60.89	-4.75	-12.15***	-7.78*	-3.92
Residents Involved in Decisions	64.22	60.93**	60.13***	66.48*	-8.12	-11.07**	-10.42*	-6.63
Community Perceptions								
Dangerous v. Safe	82.10	76.81***	79.43	85.83**	4.96	0.02***	2.48*	3.98
Run-Down v. Well-Kept	71.45	58.83***	65.45*	79.07**	0.44	-9.11***	-4.69**	1.50
Town Has More Going for It	66.77	48.91***	59.90*	71.22	1.84	-8.68***	-4.37***	0.28
Accepting of Different Races/Ethnicities	56.56	55.58	60.59**	63.30***	2.41	1.53	3.68	6.22**

Notes: Values reported as percentages except where noted. Different from Smart Shrinking places at †$p<0.10$, *$p<0.05$, **$p<0.01$, ***$p<0.001$ using Games-Howell Test. *a* actual mean. Population constant 1,420.

Appendix. Variation definitions

Population. Scale: Number. Unit: Place. Source: ACS and Decennial Census.

Population Density (People per square mile). Scale: Number. Unit: Place. Source: ACS and Decennial Census.

Minorities (Non-white race or Hispanic). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Age 17 & Under. Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Age 65 & Older. Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Single-Headed Families with Children (Families with children that are headed by a female or male). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

High School Non-Completers (Population over 25 years without a high school diploma or equivalent). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

4-Year College Graduates (Population over 25 years with a Bachelor's degree or higher). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Urban to Rural Continuum Code. Scale: 1 (urban) to 9 (rural). Unit: County. Source: ERS, USDA.

Highway Density 5 mi. Radius (Miles of primary and secondary roads within a 5 mile radius. Linear miles divided by area in square miles, multiplied by 10 for interpretation). Scale: Number. Unit: Place. Source: Iowa Department of Transportation and ESRI.

Topographic Variation. Scale: 1-4 (plains), 5-8 (tablelands), 9-12 (plains with hills & mountains), 13-17 (open hills & mountains), 18-21 (hills & mountains). Unit: County. Source: ERS, USDA.

Water Area (Percent of county area covered in water). Scale: Percent. Unit: County. Source: ERS, USDA.

Employment Participation (Employment by residence divided by population). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Full-Time & Full-Year Jobs (Employment for 35 hours or more per week for 50 or more weeks per year). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Average Travel Time to Work (For employed persons). Scale: Minutes. Unit: Place. Source: ACS and Decennial Census.

Agriculture & Natural Resources (Employment by residence in agriculture, forestry, fishing, and hunting). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Manuf., Const. & Mining (Employment by residence in manufacturing, construction, and mining). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Transport, Telecomm & Utilities (Employment by residence in transportation and warehousing, utilities, and information). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Prof. Srvs., Finance & Real Estate (Employment by residence in professional, scientific, technical services; and finance, insurance, and real estate). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Health, Social & Education Srvs. (Employment by residence in health care and social assistance; and education. Includes public and private.). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Retail Trade & Leisure Srvs. (Employment by residence in retail trade; and arts, entertainment, recreation, accommodation, and food services). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Median Household Income (2010 real dollars). Scale: Dollars. Unit: Place. Source: ACS and Decennial Census.

Poverty (Person rate). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Income Owned by Bottom 20% (Percent income owned by households in bottom quintile. Income distribution estimated from grouped income categories. See Peters 2013 for method). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Income Owned by Top 20% (Percent income owned by households in top quintile. Income distribution estimated from grouped income categories. See Peters 2013 for method). Scale: Percent. Unit: Place. Source: ACS and Decennial Census.

Occupied Housing Units. Scale: Percent. Unit: Place. Source: ACS and Decennial Census

Median Home Value (2010 real dollars). Scale: Dollars. Unit: Place. Source: ACS and Decennial Census.

Quality of Life Measures (How do you rate the quality of ___ in your community?). Scale: 1 (poor) to 5 (very good) Likert scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Close Friends in Community (About what proportion of your close personal adults friends live in the community?). Scale: 1 (none) to 6 (all) Likert scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Relatives & In-Laws in Community (About what proportion of your adult relatives and in-laws live in the community?). Scale: 1 (none) to 6 (all) Likert scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Not Trusting v. Trusting (What best describes your community?). Scale: 1 (not trusting) to 7 (trusting) semantic differential scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Indifferent v. Supportive (What best describes your community?). Scale: 1 (indifferent) to 7 (supportive) semantic differential scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Organizations Work for All (Clubs and organizations in the community are interested in what is best for all residents). Scale: 1 (strongly disagree) to 5 (strongly agree) Likert scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

New Residents as Leaders (Residents in the community are receptive to new residents taking leadership positions). Scale: 1 (strongly disagree) to 5 (strongly agree) Likert scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Prejudiced v. Tolerant (What best describes your community?). Scale: 1 (prejudiced) to 7 (tolerant) semantic differential scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Rejecting v. Open to New Ideas (What best describes your community?). Scale: 1 (rejecting of new ideas) to 7 (open to new ideas) semantic differential scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

External Linking Social Capital (How many organizations do you belong to that hold meetings outside of the community?). Scale: Number. Unit: ZIP Code. Source: ISTP.

Internal Linking Social Capital (Considering all types of groups and organizations, about how many local groups do you belong to in the community?). Scale: Number. Unit: ZIP Code. Source: ISTP.

Participated in a Project Last Year (How many times in the past 12 month have you participated in a community improvement project, such as a volunteer project or fund-raising effort?). Scale: Percent once to 10 or more times. Unit: ZIP Code. Source: ISTP.

Community Support for Projects (When something needs to get done, the whole community gets behind it). Scale: 1 (strongly disagree) to 5 (strongly agree) Likert scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Residents Involved in Decisions (Most everyone in the community is allowed to contribute to local governmental affairs if they want to). Scale: 1 (strongly disagree) to 5 (strongly agree) Likert scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Dangerous v. Safe (What best describes your community?). Scale: 1 (dangerous) to 7 (safe) semantic differential scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Run-Down v. Well-Kept (What best describes your community?). Scale: 1 (run-down) to 7 (well-kept) semantic differential scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Town Has More Going for It (Overall, this community has a lot going for it compared with other communities of similar size). Scale: 1 (strongly disagree) to 5 (strongly agree) Likert scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.

Accepting of Different Races/Ethnicities (People living in the community are willing to accept people from different racial and ethnic groups). Scale: 1 (strongly disagree) to 5 (strongly agree) Likert scale converted to 0-100 scale. Unit: ZIP Code. Source: ISTP.