Healthy neighborhoods along an urban to rural gradient

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Abstract: Neighborhoods are fundamental units of planning. Over the past century, planners have presented theories on designing the ideal neighborhood. Many of these theories include recommendations for size, population, and orientation to community health needs like food stores and healthcare facilities. Neighborhood level research pays little attention to the contexts (urban, suburban, and rural) that neighborhoods are situated in. This research aims to explore the differences in neighborhood forms, characteristics, and access to community health needs (food and healthcare) in varying contexts along an urban to rural gradient. Specifically, this study (1) explores patterns in accessing community health needs and (2) identifies patterns in people's perceived neighborhood center and boundaries in neighborhoods along an urban to rural gradient in the Wichita, Kansas, metropolitan area. This study collects data using surveys and cognitive mapping and the data is evaluated using descriptive statistics, cross tabulations, Analysis of Variance and geo-spatial analysis. Results indicate that distances to food stores are generally smaller than distances to healthcare facilities. Variations in neighborhood access and perceptions exist. Neighborhoods along the urban to rural gradient are distinct, but suburban and rural neighborhoods appear to be more alike than suburban and urban.

Keywords: urban-rural, gradient, neighborhood

Introduction

Neighborhoods are fundamental units of planning (Keller 1968, Hester 1975, Park and Rogers 2015). Many planners have developed theories that attempt to define the ideal characteristics of a neighborhood. In America, neighborhoods occur in most any setting or context including urban, suburban and rural areas (Chaskin 1997, Park and Rogers 2015). Generally, a gradient of urban form has emerged where neighborhoods are more dense in urban areas and steadily less dense as distance increases from the urban core. Often this gradient follows a major arterial road that allows for easy access by car to a range of neighborhoods (Nelson 1992). This trend has been documented as a result of a multitude of policy decisions in the United States that encourage development outside of the urban core (Schwartz 2014).

An important component of neighborhood planning is siting services like food and healthcare to ensure access to basic needs (Stewart 1985). In particular, research on this topic reveals that sufficient access to basic needs, or lack thereof, directly impacts ones' quality of life (Davis 1991, The Reinvestment Fund and Opportunity Finance Network 2012, Widener *et al.* 2013, Schwartz 2014). As important as neighborhood level planning is for the planning profession, there are gaps in understanding how neighborhoods behave in varying urban contexts and, in turn, how the provision of basic community health needs differs among these varying contexts.

Background

Neighborhood Planning

Neighborhoods abound, but can be hard to define (Chaskin 1997, Park and Rogers 2015). They signify a subset of a larger area with a unique social fabric. Many agree that neighborhoods are comprised of two components; its physical and social dimensions (Hester, 1975; Keller, 1968; Morris & Hess, 1975; Rohe, 2009). Its physical characteristics are what distinguish a neighborhood from a community. Neighborhoods are inherently place-based. The boundary of a neighborhood is used to determine the geographic location of the neighborhood. Boundaries can be made up of natural or man-made features (Keller 1968, Chaskin 1997, Park and Rogers 2015). Social characteristics of neighborhoods are based on the behaviors and characteristics of its residents. Planners tend to focus on the physical elements of a neighborhood rather than its social characteristics (Hester 1975). This research aims to explore both.

Neighborhoods have often been studied within an urban context, but it is known that they exist within many contexts (Warren 1978, Chow 1998). A critical aspect of planning includes the provision of amenities and services (McLeod 1970, American Planning Association 2018). Planned neighborhood strategies attempt to guide neighborhood design in order to accommodate basic needs.

Neighborhood Planning for Basic Needs

One of the most notable planned neighborhood theories is Clarence Perry's Neighborhood Unit Concept. The Neighborhood Unit Concept prescribed 160 acres of land, no more than 5,000 people, an elementary school at the center no more than a 5 minute walk or ¼ mile from every residence (Perry 1929). In contrast, Jane Jacobs argued that a neighborhood in a large city could be up to 100,000 people (Jacobs 1961, Park and Rogers 2015). Other neighborhood planning theories have focused instead on retail or healthcare facilities at the neighborhood center rather than a school (Engelhardt 1940, Stein 1949, Calthorpe 1993, Spreiregen and De Paz 2005, Gibbs 2012). Most planning theories consider walking distance as an important measure of access, but Spreiregan and DePaz (2005) based their neighborhood on driving distance. While the planned neighborhood theories have their critics, the legacy of guidance that planned neighborhood theories provide regarding access to basic needs is a fundamental contribution to the planning profession.

Neighborhood planning theories begin to address the importance of planning for basic needs by discussing where basic needs should be located within a neighborhood. McLeod claims that, "the purpose of a community is to satisfy the needs of people" (McLeod 1970). Accordingly, one responsibility that falls under the purview of the planning profession is providing for access to basic needs (American Planning Association 2016). Basic needs can encompass many things and many scholars have attempted to define basic needs. From the infamous Maslow's Hierarchy of basic needs to more contemporary perspectives, most proposed definitions include some reference to food and healthcare (Corning 2000). Since the 1920s, the public health field has defined its profession with a focus on the provision of basic needs (Koplan *et al.* 2009).

The urban to rural gradient as an analytical tool

In 2002, Duany and Talen proposed the concept of transect planning as a method to eliminate urban sprawl Duany and Talen's transect planning approach offered an alternative to Euclidean Zoning, zoning based on the separation of uses, which they felt was the crux of urban sprawl (Duany and Talen 2002). Since its introduction, rather than being used primarily as a planning and development tool, the transect planning approach has been modified to serve as an analytical tool by a range of professionals (Bell 1992, Sallis *et al.* 2006, Long *et al.* 2007, Yu and Ng 2007, Hahs and McDonnell 2008). For this research, the transect presents a methodology for evaluating differences in neighborhoods along the urban to rural gradient.

Development patterns happen on a continuum of urban to suburban to rural. In the United States, definitions of urban, suburban, and rural are not consistent or sufficient. The United States Census Bureau defines rural as, "what is not urban." This simplified definition overlooks many variations within urban form, the most glaring omission being suburbia. As such, the census bureau, and other federal agencies have attempted to identify additional indicators to help paint a more accurate picture. The Census Bureau categorizes urban places into urbanized areas (population > 50,000) and urban clusters (population between 2,500- 50,000). The United States Department of Agriculture (USDA) Economic Research Service (ERS) uses their Urban-Rural Continuum which categorizes places based on population and metropolitan status (Quinterno 2014). Even still there is not a specific definition of suburban places. Public agencies and researchers have proposed alternative definitions for variations in urban form (Nelson 1992, Zhou *et al.* 2004, Kolko 2015). A sample of these naming protocols is shown in Figure 1.

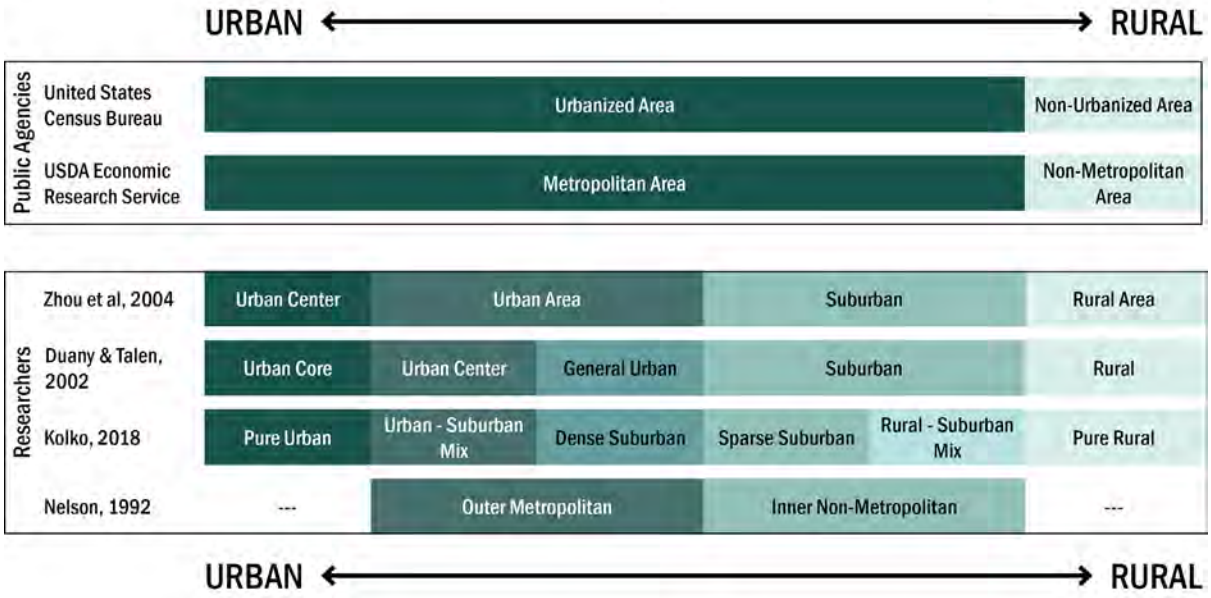


Figure 1. Examples of nomenclature of urban contexts

Methods

This research explores the differences in perceived neighborhood forms, characteristics, and access to basic needs (food and healthcare) in six neighborhoods along an urban to rural gradient outside of a representative metropolitan midwestern city (Wichita, Kansas). This study uses a mixed methods including geo-spatial data analysis. Cognitive mapping and mailed survey questionnaires were used to collect data regarding this study's research questions and aims.

The study area was located in a representative midwestern United States city and spanned approximately 15 miles from the downtown core of the city. The selected transect was comprised of six zip codes, United States Postal Service (USPS) defined geographic units, which were used as proxies for neighborhoods and were situated in varying contexts. One mail route in each zip code was randomly selected to receive the questionnaire (Figure 2). This resulted in a stratified clustered sample. The questionnaire included two map-base questions. These questions asked respondents to identify their neighborhood boundary and center and also identify the locations where they access food and healthcare most frequently. The questionnaire also include questions about neighborhood characteristics and travel patterns to basic needs. Surveys were distributed and returned by mail. An incentive was provided for completed surveys in an effort to increase response rate.

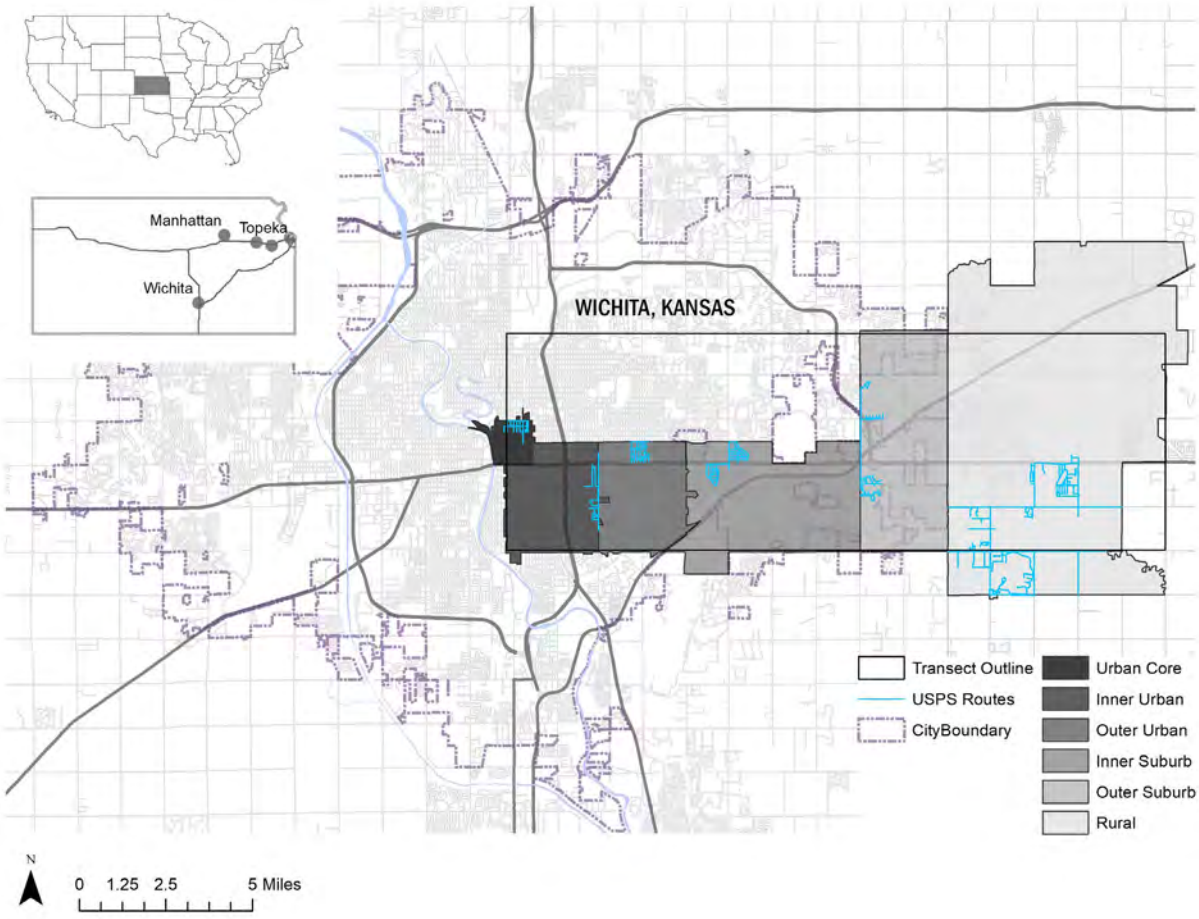


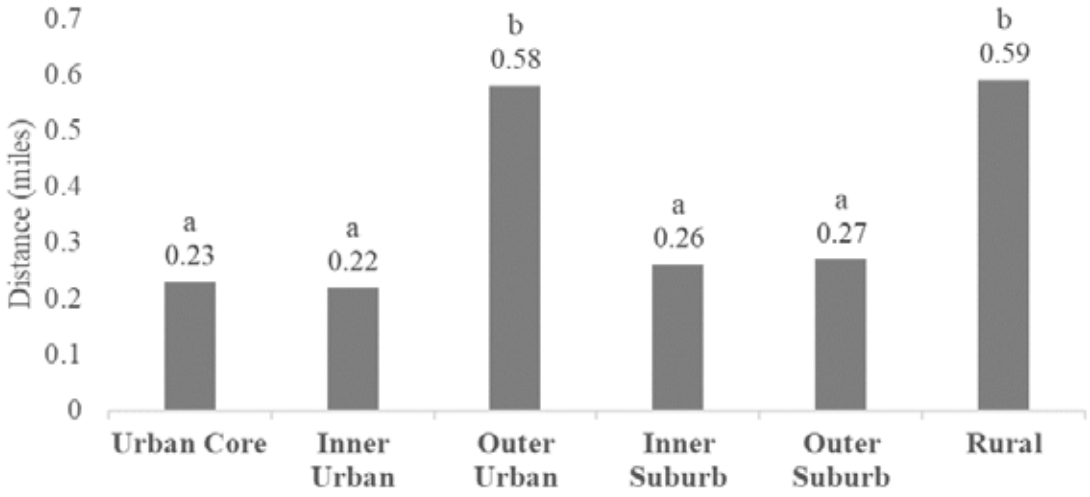
Figure 2. Map of Study Area showing neighborhoods, zip codes and mail routes

Results

Neighborhood Characteristics

The average size of neighborhoods identified by respondents was just under 1 square mile (0.95 mi^2). The smallest neighborhood (0.05 mi^2) was identified in the Urban Core neighborhood and the largest neighborhood (12.62 mi^2) was identified in the Rural neighborhood, however, neighborhood size was not determined to be significantly different among neighborhoods.

Overall, neighborhood centers were identified as less than half a mile away from home (0.39 mi). The Rural and Outer Urban neighborhoods had the longest mean distance from home to neighborhood center (Figure 3). All other neighborhoods had a mean distance from home to neighborhood center that was about 0.25 miles.



Letters indicate significant differences at $p<0.05$.

Figure 3. Neighborhood Characteristics by Neighborhood

In the Urban Core and Inner Urban neighborhoods, respondents were more likely to identify a neighborhood institution like a church as their neighborhood center. Few respondents identified a school as their neighborhood center (1.3%). Few overall residents identified shopping centers as their neighborhood center (7.7%), however, 1 in 5 respondents in the Outer Urban neighborhood identified a shopping center as their neighborhood center (Figure 4). In suburban and rural areas, residents primarily identified their home as their neighborhood center, but some also identified a recreation center or country club.

In terms of characterizing their own neighborhoods, generally, respondents identified their neighborhood along with its urban context. All the respondents in the Urban Core neighborhood characterized their neighborhood as "inner city or downtown." Suburban residents tended to identify their neighborhood as "suburban." In the Rural neighborhood, the majority of respondents identified their neighborhood as either "suburban" or "rural" (Figure 4).

A majority of overall respondents (77.3%) indicated that roads were a factor in determining their neighborhood boundary. In urban neighborhoods, one-third of respondents cited the use of buildings or commercial centers to delineate their neighborhood boundary. Natural features or parks were more likely to be used to draw neighborhood boundaries in urban and suburban neighborhoods. Residents in the Outer Suburb and Rural neighborhood identified neighborhood subdivisions or developments as their neighborhood boundary (Figure 4).

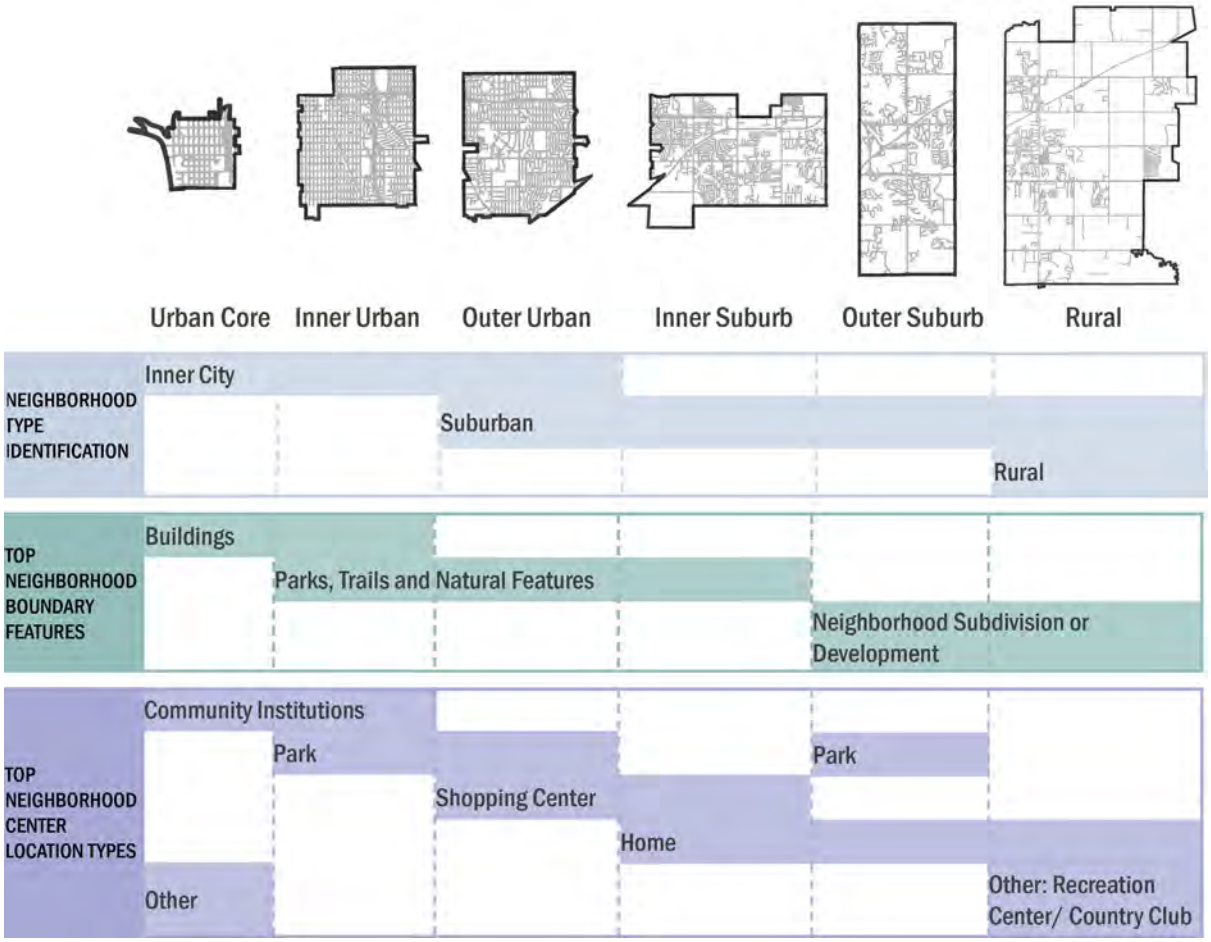


Figure 4. Neighborhood Characteristics by Neighborhood

Access to Basic Community Health Needs

Overall, a majority of respondents (87%) identified the food store that they visit most frequently. Fewer identified their healthcare facility (74%). Overall patterns of travelling to food and healthcare were similar in origin point, and satisfaction, but differed in mode, frequency of travel, travel companions, time, and distance. The most common type of food stores visited were supermarkets and the most common type of healthcare facilities visited were general practitioners. Generally, respondents travel to food stores and healthcare facilities from home, by themselves and by vehicle. Respondents were generally satisfied with their level of access to these community health needs. The majority of respondents travel to a food store at least once per week and travel to a healthcare facility a few times per year (Table 1).

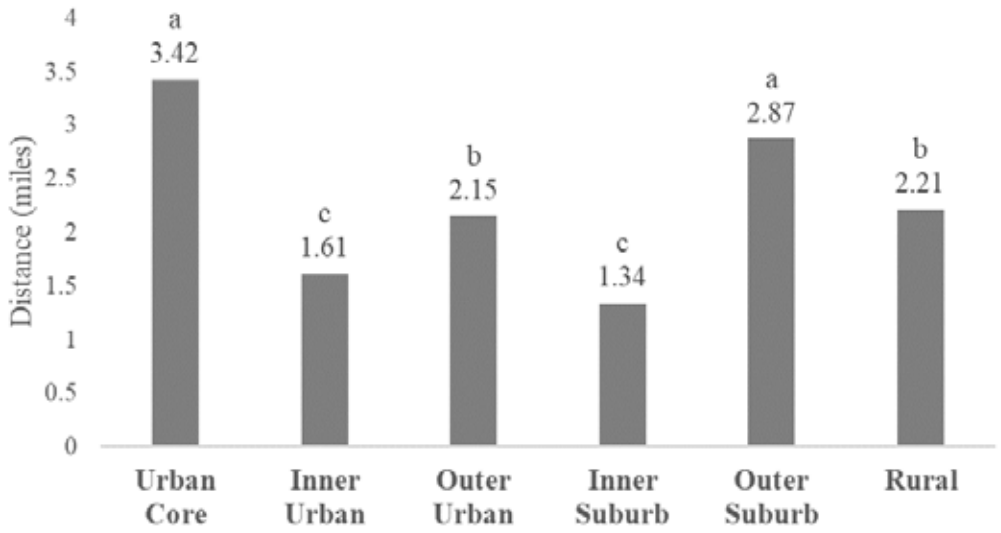
Table 1. Travel Patterns by Type of Need

	Food	Healthcare
Type	Supermarket	General Practitioner
Origin Point	From home (88.2%)	From home (71.1%)
Satisfaction	Satisfied (87.5%)	Satisfied (83.3%)
Mode	Drive/ride in vehicle (96.3%)	Drive/ride in vehicle (96.6%)
Frequency	At least once per week (82.8%)	A few times a year (83.9%)
Travel Companion	Alone (75.1%)	Alone (74.4%)
Mean Network Distance	2.16 miles	3.33 miles

Access to Food by Neighborhood

Overall, the majority of respondents visit a supermarket or grocery store most frequently (92.4%), however, those in the Urban Core neighborhood were less likely to go to a supermarket or grocery store. Respondents generally use a vehicle to get to food stores, however in the Urban Core, respondents were more likely to bike, bus or walk (25.0%). Overall, travel time to a food store takes an average of 9 minutes, but in the Urban Core, the mean travel time to a food store was 20 minutes. Generally, respondents travel to food stores at least once per week (82.8%). Respondents in the Urban Core neighborhood were most likely to be dissatisfied with their food stores (50.0%).

The mean network distance to a food store was 2.11 miles. The Outer Suburb and Urban Core neighborhoods had the longest mean distances to food stores. The Inner Suburb and Inner Urban neighborhoods had the shortest mean distances to food stores (Figure 5). The longest individual distance to a food store was found in the Urban Core (7.69 miles) and the shortest individual distance was found in the Inner Urban (0.18 miles) neighborhood.



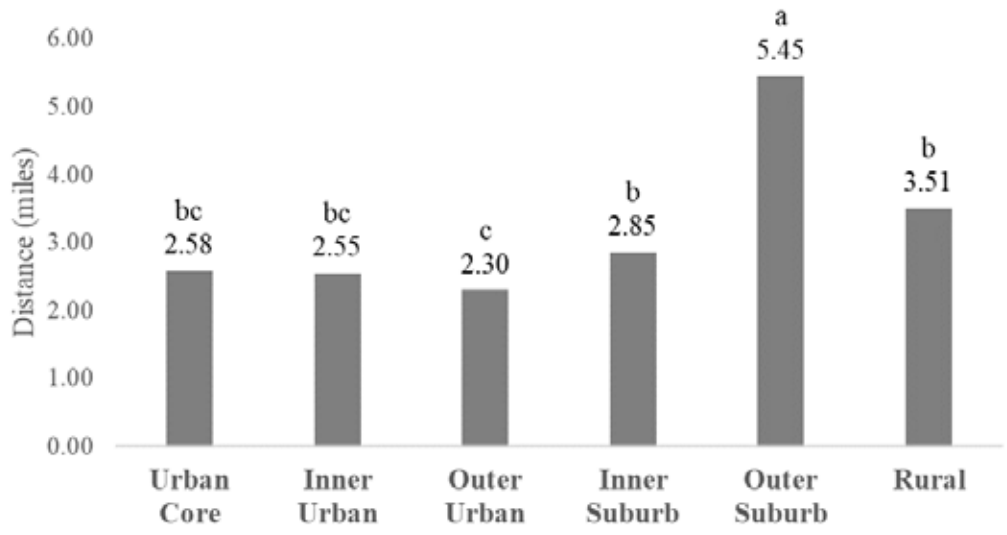
Letters indicate significant differences at $p<0.05$.

Figure 5. Mean Network Distance to Food Store by Neighborhood

Access to Healthcare by Neighborhood

Overall, respondents indicated that they visit a general practitioner or family doctor (81.3%) most frequently. Respondents were most likely to have an ongoing or serious health problem in Urban Core (34.8%) and Inner Urban (40.6%) neighborhoods. Respondents in the Urban Core were more likely to bus, walk or bike to their healthcare facility than all other neighborhoods. Respondents were generally satisfied with their healthcare facility. Respondents in urban areas were more likely to travel to healthcare alone than respondents in rural areas.

The mean network distance to a healthcare facility was 3.33 miles. The Outer Suburb had the longest mean distance to a healthcare facility. The Urban neighborhoods had the shortest mean distance to a healthcare facility (Figure 6). Both the longest (12.56 miles) and shortest (0.35 miles) individual distances to healthcare were located in the Inner Suburban neighborhood.



Letters indicate significant differences at $p<0.05$.

Figure 6. Mean Network Distance to Healthcare by Neighborhood

Patterns begin to emerge regarding overall neighborhood access to community health needs (Table 2). The longest distances to community health needs are located in the Outer Suburb and in the Urban Core (for food only). The shortest distances to community health needs are located in the Inner Urban and Inner Suburb (for food) and the Outer Urban neighborhood (for healthcare).

Table 2. Mean Network Distances to Community health needs by Neighborhood

Mean Network Distance (miles)	**Urban Core**	**Inner Urban**	**Outer Urban**	**Inner Suburb**	**Outer Suburb**	**Rural**
From Home to Food	3.42^{a}	1.61^{c}	2.15^{b}	1.34^{c}	2.87^{a}	2.21^{b}
From Home to Healthcare	2.58^{bc}	2.55^{bc}	2.30^{c}	3.85^{b}	5.45^{a}	3.51^{b}

Note: Superscript letters indicate significant differences at $p<0.05$.

Discussion

Research on neighborhood perceptions show that residents in urban areas tend to identify their neighborhood as smaller than suburban areas (Haney and Knowles 1978, Haeberle 1988, Chaskin 1997). Additionally, certain demographics (minorities, older adults, long-term residents) have been known to perceive their neighborhood as smaller than others (Pebley and Sastry 2009). In this study, however, the perceived size of each neighborhood did not vary significantly. Overall, little variation in racial and minority demographics were seen in this study, so little effects could be attributed to racial or ethnic makeup in the neighborhoods. While some neighborhoods showed higher percentages of older adults and longer tenure in their neighborhood, a relationship to neighborhood size was not found. This could be because the neighborhoods were being compared between urban, suburban, and rural instead of just urban to suburban as was the case in some studies (Haney and Knowles 1978). It could also be related to the type of cognitive mapping used in this study. Many studies that include neighborhood mapping provide residents with a blank canvas (Orleans 1973, Coulton *et al.* 2001), whereas this study provided a base map containing the information of street and location of community health needs for respondents to draw and identify what they perceive and use.

While the perception of size did not vary among neighborhoods, the distances from home to neighborhood center did vary significantly between neighborhoods. The distances to the neighborhood center in the Outer Urban and Rural neighborhoods were more than twice as long as the distance to neighborhood center for all other neighborhoods. This could mean that neighborhood size may actually vary, but not in a way that is perceived by residents. Still, in all six neighborhoods, the mean distance to neighborhood centers generally aligned with the recommendations of neighborhood planning theories of ¼ mile to ½ mile distance to the neighborhood center (Perry 1929, Calthorpe 1993).

Neighborhood planning theories identify the types of community institutions that should be at the center of a neighborhood. These recommendations primarily include schools (Perry 1929) and shopping centers (Stein 1949, Spreiregen and De Paz 2005). Few residents in this study identified schools as their neighborhood center. In fact, the mean distance to school overall was nearly 3 miles. However, residents in the Urban Core and Inner Urban neighborhoods exhibited tendencies of a structural or institutional perspective, one that orients community institutions at the center. Whereas suburban and rural residents were most likely to exhibit tendencies of an egocentric perspective, one that situates home at the center of a neighborhood (Guest and Lee 1984, Lee and Campbell 1997). Demographic characteristics of these types of perspectives identified in Lee & Campbell's study (1997) were also seen in this study. For instance, in both studies, the residents with structural/institutional neighborhood perspectives were more likely to be male, single, and have shorter housing tenure (Lee and Campbell 1997).

Neighborhood boundaries are thought to be made up of visible or invisible features (Park and Rogers 2015). In Lynch's foundational work regarding elements of a city, an "edge" relates most closely to the idea of the neighborhood boundary. Lynch's work acknowledges that edges, or boundaries, can be composed of different elements (Lynch 1960). In all neighborhoods, a majority of residents noted roads as components of their neighborhood boundary. Residents in urban and areas also used buildings or parks/trails as references for drawing their neighborhood boundary. The use of buildings or landmarks to delineate neighborhoods is not uncommon. Buildings can represent a contrast in land use from residential areas, and can allow buildings to serve as effective borders (Alexander *et al.* 1977). In the outer suburban and rural areas, buildings were not often used to create neighborhood boundaries, rather residents identified their particular subdivision or residential development's boundaries. Residents in the rural neighborhood were more likely to draw their neighborhood irrespective of the elements on the map. Interestingly, residents in planned neighborhoods are typically found to have a clear understanding of their neighborhood boundaries (Park and Rogers 2015). Perhaps, in suburban and rural areas, boundaries are known, but residents have little say in the creation of them.

Residents generally categorized their neighborhood as its appropriate urban context (urban, suburban, rural). Respondents in the Urban Core were resolute in their characterization of their neighborhood as inner city or downtown, but all other neighborhoods were less unanimous. While the rural neighborhood studied in this sample included some subdivisions that could be considered suburban, residents in this neighborhood still identified as living in a rural area. The lack of clarity in defining urban contexts on a national level underscores the increased variation seen in neighborhood characterization in non-urban areas along this transect.

Generally, travel patterns to community health needs did not vary by neighborhood or urban context. However, the urban core was most likely to bike, bus, or walk to all three community health needs. The Urban Core also had the fewest mean number of vehicles per household. Residents in urban centers are known to make more trips on public transit than those that live a further distance from the urban core (Millward and Spinney 2011). Additionally, research shows that people living in urban areas are more likely to walk while residents in rural areas are less likely to walk (Frank *et al.* 2008, Kegler *et al.* 2015).

Distances to community health needs among neighborhoods varied. Overall, the Outer Suburb had the longest distance to community health needs. Generally, the distances to community health needs were longer in the suburbs and rural neighborhoods, but not always. Conversely, the urban neighborhoods generally had shorter distances to community health needs, but not always. The Urban Core had the longest mean distance to food stores, but some of the lowest distances to healthcare. Generally, the neighborhoods that had longer mean distances to community health needs also had fewer locations of community health needs identified in their neighborhood. Compact built environments, low residential population density in urban core due to concentration of businesses, and lower socioeconomic status of residents have been cited as challenges for sustaining retail food stores in downtown urban areas(Walker *et al.* 2010). Access to healthcare facilities, as measured in distance, has been shown to decrease as one moves further from the center of a city (Bissonnette *et al.* 2012).

This research finds that there are differences in ways that residents perceive their neighborhood boundaries and centers among neighborhoods along the urban to rural gradient. Connections to the recommendations of planned neighborhood theories exist in all urban contexts. Travel patterns along the urban to rural gradient did not differ among neighborhoods even though the distances did. This research found that more differences occurred along neighborhoods regarding neighborhood characteristics than access to community health needs. The imperative to access food and healthcare could imply that distance is not always the most important concern.

Future Research

Further research needs to be done to understand the underlying contexts that affect the patterns seen in this study. Additional external factors likely had an impact on the differences in neighborhood patterns and characteristics that were not explored in this study. Information related to household workplaces in relation to accessing community health needs would likely provide deeper context into the reasons that some drive further to access community health needs.

This study applied the transect methodology to understand differences among neighborhoods along a 15-mile transect. This methodology could be applied to an urban to rural gradient that spans a larger area, potentially 30-60 miles long which could confirm the patterns seen within neighborhoods in this study and illuminate patterns evident in neighborhoods of starker contrast.

Conclusion

Two main research questions were posed in this study:

Do urban, suburban, and rural residents classify their neighborhood centers and boundaries similarly?

This research identified patterns in perceived neighborhood characteristics like boundaries and neighborhood centers. Residents identified their neighborhood centers and boundaries differently among urban, suburban, and rural areas. Urban areas were more likely to identify landmarks outside of their home as the neighborhood center or as part of their neighborhood boundary, while suburban and rural residents were more likely to identify their home as the neighborhood center and use subdivision boundaries as neighborhood boundaries. Patterns found in suburban and rural neighborhoods resembled each other more than patterns in urban and suburban neighborhoods. This is important to note because of the way that suburban areas are typically considered part of urban areas.

Do neighborhood residents' patterns vary in accessing community health needs of food and healthcare?

This research identified patterns in accessing community health needs like food, healthcare, and education along the urban to rural gradient. Travel patterns in access community health needs were not shown to vary significantly except for in mode of travel in the Urban Core where residents were more likely to bike, bus, or walk to community health needs. Significant variation occurred regarding the network distance to community health needs. The Outer Suburb neighborhood had the furthest mean distance from all three community health needs while the Inner and Outer Urban neighborhoods has the shortest mean distance to community health needs.

The transect methodology approach was useful in identifying patterns and differences among neighborhoods along an urban to rural gradient. In some cases, differences were not seen; the perception of neighborhood size did not vary among urban contexts as was anticipated. Variation in density and urban form are evident along the transect, but neighborhood size perceptions are not. In other areas, differences occurred where expected; the differing characteristics of neighborhood centers in urban, suburban, and rural areas.

Perceived neighborhood characteristics were more likely to vary among neighborhoods than travel patterns to community health needs. While accessing basic need is an important component of day-to-day life, the community health needs appear to have less linkage to a residents' perception of a neighborhood.

Many of the identified neighborhood characteristics in this study relate to neighborhood planning theories and their range of possibilities for neighborhood characteristics. The lack of schools being cited as neighborhood centers, a foundational component of Perry's Neighborhood Unit Concept, raises the question of whether Perry's ideal neighborhood is as relevant as it used to be to the planning profession. However, programs like "Safe Routes to Schools" that encourage children and their parents to walk or bike to school could reinforce some of Perry's ideas moving forward.

Suburban and rural neighborhoods tended to behave similarly more so than suburban and urban neighborhoods. This demonstrates that the current definition of urban and rural are not sufficient. Planners are known to use established administrative boundaries when conducting neighborhood level plans. If planners are using the urban/rural designation to determine neighborhoods, this could lead to inappropriate planning recommendations. Instead of comparing strictly urban to rural, this study provides a framework for planners to understand and assess differences along a gradient that is relevant for future planning projects.

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References

Alexander, Ishikawa, and Silverstein, 1977. A Pattern Language: Towns, Buildings, Construction (Center for Environmental Structure), 1.

American Planning Association, 2016. *AICP Code of Ethics and Professional Conduct*. American Planning Association.

American Planning Association, 2018. Planning and Community Health Center [online]. *American Planning Association*. Available from: https://www.planning.org/nationalcenters/health/ [Accessed 25 Feb 2019].

Bell, M., 1992. The Fruit of Difference: The Rural-Urban Continuum as a System of Identity. *Rural Sociology*, 57 (1), 65–82.

Bissonnette, L., Wilson, K., Bell, S., and Shah, T.I., 2012. Neighbourhoods and potential access to health care: The role of spatial and aspatial factors. *Health & Place*, 18 (4), 841–853.

Calthorpe, P., 1993. *The next American metropolis: Ecology, community, and the American dream*. Princeton architectural press.

Chaskin, R.J., 1997. Perspectives on Neighborhood and Community: A Review of the Literature. *Social Service Review*, 71 (4), 521–547.

Chow, J., 1998. Differentiating urban neighborhoods: A multivariate structural model analysis. *Social Work Research*, 22 (3), 131–142.

Corning, P.A., 2000. Biological Adaptation in Human Societies: a `Basic Needs' Approach. *Journal of Bioeconomics*, 1, 41–86.

Coulton, C.J., Korbin, J., Chan, T., and Su, M., 2001. Mapping Residents' Perceptions of Neighborhood Boundaries: A Methodological Note. *American Journal of Community Psychology*, 29 (2), 371–383.

Davis, K., 1991. Inequality and Access to Health Care. *The Milbank Quarterly*, 69 (2), 253–273.

Duany, A. and Talen, E., 2002. Transect planning. *American Planning Association. Journal of the American Planning Association; Chicago*, 68 (3), 245–266.

Engelhardt, N.L., 1940. *Planning the community school*. American Book Company.

Frank, L.D., Kerr, J., Sallis, J.F., Miles, R., and Chapman, J., 2008. A hierarchy of sociodemographic and environmental correlates of walking and obesity. *Preventive Medicine*, 47 (2), 172–178.

Gibbs, R.J., 2012. *Principles of urban retail planning and development*. John Wiley & Sons.

Guest, A.M. and Lee, B.A., 1984. How urbanites define their neighborhoods. *Population and Environment*, 7 (1), 32–56.

Haeberle, S.H., 1988. People or Place: Variations in Community Leaders' Subjective Definitions of Neighborhood. *Urban Affairs Quarterly*, 23 (4), 616–634.

Hahs, A. and McDonnell, M., 2008. Selecting independent measures to quantify Melbourne's urban-rural gradient. *Landscape and Urban Planning*, 78.

Haney, W.G. and Knowles, E.S., 1978. Perception of neighborhoods by city and suburban residents. *Human Ecology*, 6 (2), 201–214.

Hester, R.T., 1975. *Neighborhood Space*. Dowden, Hutchinson & Ross.

Jacobs, J., 1961. *The Death and Life of Great American Cities*. London: Jonathan Cape.

Kegler, M.C., Alcantara, I., Haardörfer, R., Gemma, A., Ballard, D., and Gazmararian, J., 2015. Rural Neighborhood Walkability: Implications for Assessment. *Journal of Physical Activity and Health*, 12 (6 Suppl 1), S40–S45.

Keller, S.I., 1968. *The urban neighborhood: a sociological perspective*. Random House.

Kolko, J., 2015. How Suburban Are Big American Cities? *FiveThirtyEight*.

Koplan, J.P., Bond, T.C., Merson, M.H., Reddy, K.S., Rodriguez, M.H., Sewankambo, N.K., and Wasserheit, J.N., 2009. Towards a common definition of global health. *The Lancet*, 373 (9679), 1993–1995.

Lee, B.A. and Campbell, K.E., 1997. Common Ground? Urban Neighborhoods as Survey Respondents See them. *Social Science Quarterly (University of Texas Press)*, 78 (4), 922–936.

Long, H., Heilig, G.K., Li, X., and Zhang, M., 2007. Socio-economic development and land-use change: Analysis of rural housing land transition in the Transect of the Yangtse River, China. *Land Use Policy*, 24 (1), 141–153.

Lynch, K., 1960. The City Image and Its Elements. *In*: *The People, Place, and Space Reader*. Routledge, 50–55.

McLeod, A., 1970. The '16 Needs Concept' for Urban Growth. *The Australian Quarterly*, 42 (3), 91–93.

Millward, H. and Spinney, J., 2011. Time use, travel behavior, and the rural–urban continuum: results from the Halifax STAR project. *Journal of Transport Geography*, 19 (1), 51–58.

Nelson, A.C., 1992. Characterizing Exurbia. *Journal of Planning Literature*, 6 (4), 350–368.

Orleans, P., 1973. Differential Cognition of Urban Residents: Effects of Social Scale on Mapping. *In*: *Image and Environment: Cognitive Mapping and Spatial Behavior*. Transaction Publishers, 115–130.

Park, Y. and Rogers, G.O., 2015. Neighborhood Planning Theory, Guidelines, and Research: Can Area, Population, and Boundary Guide Conceptual Framing? *Journal of Planning Literature*, 30 (1), 18–36.

Pebley, A. and Sastry, N., 2009. Our Place: Perceived Neighborhood Size and Names in Los Angeles. *UCLA CCPR Population Working Papers*.

Perry, C., 1929. *The Neighborhood Unit*. Taylor & Francis.

Quinterno, J., 2014. *Running the Numbers: A Practical Guide to Regional Economic and Social Analysis: 2014*. 1 edition. Armonk, New York: Routledge.

Sallis, J.F., Cervero, R.B., Ascher, W., Henderson, K.A., Kraft, M.K., and Kerr, J., 2006. An Ecological Approach to Creating Active Living Communities. *Annual Review of Public Health*, 27 (1), 297–322.

Schwartz, A., 2014. Trends, Patterns, Problems. *In*: *Housing Policy in the United States*. Taylor & Francis.

Spreiregen, P.D. and De Paz, B., 2005. *Pre-design*. Kaplan AEC Architecture.

Stein, C.S., 1949. Toward New Towns for America. *The Town Planning Review*, 20 (3), 203–282.

Stewart, F., 1985. *Planning to Meet Basic Needs*. Springer.

The Reinvestment Fund and Opportunity Finance Network, 2012. *Searching For Markets: The Geography of Inequitable Access to Healthy & Affordable Food in the United States*.

Walker, R.E., Keane, C.R., and Burke, J., 2010. Disparities and access to healthy food in the United States: A review of food desserts literature. *Health & Place*, 16.

Warren, D.I., 1978. Explorations in Neighborhood Differentiation. *The Sociological Quarterly*, 19 (2), 310–331.

Widener, M.J., Metcalf, S.S., and Bar-Yam, Y., 2013. Agent-based modeling of policies to improve urban food access for low-income populations. *Applied Geography*, 40.

Yu, X.J. and Ng, C.N., 2007. Spatial and temporal dynamics of urban sprawl along two urban–rural transects: A case study of Guangzhou, China. *Landscape and Urban Planning*, 79 (1), 96–109.

Zhou, D., Xu, J., Radke, J., and Mu, L., 2004. A spatial cluster method supported by GIS for urban-suburban-rural classification. *Chinese Geographical Science*, 14 (4), 337–342.