



HHS Public Access

Author manuscript

Health Place. Author manuscript; available in PMC 2017 November 01.

Published in final edited form as:

Health Place. 2016 November ; 42: 111–119. doi:10.1016/j.healthplace.2016.09.010.

Older Adult Social Participation and its Relationship with Health: Rural-Urban Differences

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Abstract

In an aging world, there is increased need to identify places and characteristics of places that promote health among older adults. This study examines whether there are rural-urban differences in older adult social participation and its relationship with health. Using the 2003 and 2011 waves of the Wisconsin Longitudinal Study (n=3,006), I find that older adults living in rural counties are less socially active than their counterparts in more-urban counties. I also find that relationships between social participation and health vary by both activity and place.

Keywords

Social Participation; Self-Rated Health; Rural-Urban Differences; Older Adults; Counties

Introduction

As the proportion of older adults around the world has grown and is projected to increase further, global organizations have stressed the importance of ensuring that seniors live in “enabling environments” and “age-friendly communities” (Plouffe & Kalache, 2010; United Nations Population Fund, 2012). Two important components of these environments are a positive social setting and opportunities for social participation, since research has generally found associations between social participation and positive older-adult health outcomes (Menec et al., 2011). Indeed, these relationships have been identified across numerous contexts, including North America (Gilmour, 2012; Glass et al., 1999), East Asia (Hsu, 2007; Kondo et al., 2007), and Europe (Bennett, 2005; Sirven & Debrand, 2008). Unfortunately, much less is known about how older adult social participation varies across space (Clarke & Nieuwenhuijsen, 2009). In particular, researchers have just begun to study how social environments differ between rural-urban contexts; and the implications this may have for older adults living in these places (Levasseur et al., 2015).

This paper has two objectives. The first is to investigate whether and how social participation among older adults varies between rural and urban settings. The second goal is

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to identify whether *the relationships* between social participation and health differ between these contexts. The two goals work in concert since the implications of the former depend on results found in the latter. For example, community center use may be more common in urban counties (goal 1), but not associated with well-being (goal 2). If so, this may indicate that certain structural differences between urban and rural places have limited health consequences. Conversely, suppose that older adults living in rural areas meet friends less often than those living in urban areas (goal 1); and these gatherings are associated with better health (goal 2). This would highlight one way in which older adults living in rural locations are being “left behind” by differential social environments.

Background

Social Participation and Older Adult Health

Numerous studies have established positive relationships between social participation and improved health outcomes (Kim et al., 2008). While less plentiful, there is increasing evidence suggesting that these associations are even stronger among older adults (Morrow-Howell & Gehlert, 2012). One reason this may be the case is that a majority of seniors are no longer working. That is, retirement not only results in the loss of a primary outlet for social interaction, it also is often accompanied by more free time in which to join social groups. In addition, the benefits of physical movement related to regular group activities may be particularly important for older adults looking to delay functional decline (Hamar et al., 2013). Lastly, a greater life purpose that some of these activities may bring could compensate for the loss of family or friends that have died or moved away (Bath & Deeg, 2005).

Robert Putnam's *Bowling Alone* (2000) is often credited as motivating research that highlights possible implications of a disconnected society. It also brought widespread attention to what he described as a multi-decade decline in social capital throughout the United States—particularly as it related to community engagement and social participation. Putnam hypothesized that this decline was associated with a number of negative consequences, including more deleterious health outcomes for those living in places that are not as socially and civically connected (Elgar et al., 2011). Although *Bowling Alone* did not specifically focus on older adults, it details how the United States' “Greatest Generation”—which was entirely 65-plus by 2010—represents the U.S.'s last “cohort of joiners” (i.e., relatively high levels of community and civic engagement) (Brand & Burgard, 2008; Putnam, 2000). Despite its salient contributions, *Bowling Alone* contains a number of theoretical and empirical limitations. For one, Putnam often relied on social capital at the state-level to explain negative social consequences, even though there is likely a high degree of within-state heterogeneity. In particular, a significant portion of the variability in social capital between states is likely accounted for by *rural-urban differences* in social capital within states (Durlauf, 2002). Secondly, Putnam's research makes it difficult to make even basic causal claims. For example, relationships between social participation and health may be attributable to the fact that healthy individuals likely have a greater ability to be socially active.

Both *Bowling Alone* and the broader literature linking older adult health to place are frequently unclear as to which activities form various aspects of social capital (Poulsen et al., 2011). To address this ambiguity, the present manuscript explicitly focuses on *social participation*. While there is no consensus on its definition, prior work overwhelmingly points to “involvement with activities that provide an interaction with others in the community” (Levasseur et al., 2010). In addition to necessitating a group component, this description stresses the importance of community and, thus, the local—local friends, local places and local groups. Interestingly, research linking social participation to health does not always explicitly focus on “social participation”, per se. Instead, it often investigates relationships between health and *specific activities* that are widely considered elements of social participation under this definition—such as group exercise (Rubenstein et al., 2000), religious participation (Hill et al., 2014), and volunteer work (Fried et al., 2004; Hanlon et al., 2014). This is notable since mechanisms linking social participation to health likely depend on the type of activity. For example, exercise groups may improve health through strength training; religious participation by providing a sense of purpose; and volunteering by a combination of physical, psychological, and cognitive pathways.

Rural-Urban Differences

There is growing evidence that suggests older adult health differs between those living in rural and urban locations (Burholt & Dobbs, 2012; Therrien & Desrosiers, 2010). As a likely correlate of healthy aging, identifying and understanding geographic variation in older-adult social participation may be one way to explain these disparities (Annear et al., 2014). On one hand, older adults living in rural places are often idealized as possessing stronger ties to their communities and retaining high-quality relationships with friends for decades (Keating, 2008). In addition, there is evidence suggesting older adults are increasingly volunteering and positively transforming rural communities that are facing numerous structural challenges (Hanlon et al., 2014; Joseph & Skinner, 2012). Conversely, seniors living in these same places may experience greater isolation, have access to fewer senior-focused amenities, and face transportation challenges that, in turn, could be associated with lower rates of social participation (Eby et al., 2008; Nyqvist et al., 2013).

Prior research investigating possible rural-urban differences in social participation—whether or not it focuses on older adults—is limited and provides mixed conclusions. For example, two different studies of older adults in Quebec found little evidence that social participation varied between metropolitan, urban and rural locations (Levasseur et al., 2015; Therrien & Desrosiers, 2010). That said, the results obtained by Levasseur and colleagues provide evidence that the environmental determinants of senior participation (e.g., proximity of resources, transportation options) do systematically differ between rural and urban contexts. Conversely, a study of Chinese adults found that those living in urban counties report greater social participation than those in rural counties (Meng & Chen, 2014); although it is unclear which activities these differences were attributable to. Similarly, one U.S. study found that structural disadvantage—including lower social capital, broadly—was more common in U.S. rural counties, when compared to urban ones (Monnat & Beeler Pickett, 2011).

Despite increasing interest in whether social participation or health varies between rural or urban settings, there has been inadequate consideration as to whether *relationships* between social participation and older adult health differ between these places. On one hand, there may not be obvious reasons to expect that an association between exercise and health differs by residential location. On the other hand, relationships between religious participation and health, for example, could conceivably vary across rural-urban contexts if rural older adults possess distinct practices or beliefs that are linked to health (Mitchell & Weatherly, 2000). For one region in Finland, Nummela and colleagues (2009) found that being in roughly the top half of social participation scores was associated with better health when living in urban and rural places; but not in suburban locations. Similarly, a study of Canadian older women found that social capital had stronger relationships with health for urban residents; when compared to their rural counterparts (Wanless et al., 2010). One limitation of both studies is that it is unclear whether these relationships depended on or differed by particular social activities. In addition, the cross-sectional nature of these studies limit the ability to draw many conclusions with respect to the direction of causality. This is particularly notable since longitudinal studies tying social participation to health—particularly those focusing on older adults—are scarce and have been mostly set in Northern Europe (Murayama et al., 2012).

Social Participation and Activity Spaces

Social participation emphasizes activities that provide interaction with others in the local community, there are three compelling reasons to conceptualize these “activity spaces” at administrative areas larger than a census tract or town; such as counties, districts, or regional municipalities (Perchoux et al., 2013). One, these units capture greater metropolitan areas that often share resources and amenities relevant for social participation. In other words, many social activities (i.e., going to a museum, being involved with a senior center, joining a team sports club) are often centered within a larger contextual sphere that benefits individuals across numerous neighborhoods.

Two, research has begun to question the appropriateness of neighborhoods to adequately capture activity spaces. In particular, the literature on “neighborhood effects” assumes that *living* in a particular census tract has associations with particular outcomes. This may be problematic, however, if individuals have little connection to the social environment within their neighborhood or are primarily engaged in activities outside their neighborhood. For example, research by Milton et al. (2015) and Jones (2014) suggests that neighborhoods and census tracts did not adequately capture activity spaces of English older adults and Los Angeles residents, respectively. Conceptualizing activity places as covering a larger area than a neighborhood may be even more important in rural places, where “local” friends could live miles from home, and long drives to activities may be normative.

Three, counties and districts generally share a political history and environment that shape the characteristics of older adults living there; including the administration of infrastructure-related improvements (Gerstorff et al., 2010; McLaughlin et al., 2001). In other words, they can capture local conditions and represent areas relevant for social planning (Monnat & Beeler Pickett, 2011).

Data and Methods

Data

This study uses the Wisconsin Longitudinal Study (WLS), a long-term survey of a random sample of 10,317 men and women who graduated from Wisconsin high schools in 1957. Data was collected from the original respondents in 1957, 1975, 1992, 2003, and 2011. One key benefit of the WLS is that it is broadly representative of white non-Hispanic American men and women that have at least a high school education (Herd, 2010). Also, about 19 percent of its sample is of farm origin; consistent with estimates of such Americans born in the late 1930s. There are three distinct advantages of employing the WLS to study relationships between social participation, place, and health. One, these individuals—born around 1940—represent the end of the “Greatest Generation”, a group referenced for their high degree of social engagement (Brand & Burgard, 2008; Putnam, 2000). Two, unlike many other surveys of older adults, the WLS includes detailed information on numerous social activities; including the extent of these activities (as opposed to a dichotomous measure of involvement). Three, by using the two most recent waves of the WLS, I can test whether social participation in the early stage of older ages has independent relationships with health almost a decade later. This study uses a restricted version of this dataset that allows me to attach residential county population density to individual responses.

In order to study relationships between social participation and health among older adults, I use the 2011 (mean age=71) and 2003 (mean age=63) waves. Between 1957 and 2011, a total of 2,826 individuals were lost to survey attrition or death. Out of the 7,491 individuals remaining in the 2011 sample, 5,969 completed an in-person interview; 5,177 of whom also completed a subsequent mail survey. Only the latter are used in this analysis, as the mail survey included the detailed information on health and social participation. In order to ensure adequate representation and comparable social environments, this analysis also omits the 1,531 individuals that no longer live in Wisconsin. Lastly, some of the 2011 respondents did not answer the SRH question (n=65) or did not participate in the 2003 mail survey (n=575); resulting in a final analytical sample of 3,006 (hereafter, the “WLS respondents”). The consequences of these analytical decisions and survey attrition are considered in the *Sensitivity Analyses* section of the manuscript.

The 20th most populous U.S. state, Wisconsin had approximately 5.7 million residents in 2010 (approximately the same size as Denmark); 13.7% of which were 65-plus. The state is mostly rural and contains only five municipalities with populations greater than 75,000. The vast majority (94.5%) of older Wisconsin citizens are white; and three-quarters of the state's African-American senior population resides in the city of Milwaukee.

Methods: Rural-Urban Counties

To create rural and urban residential categories for Wisconsin residents, I employed relative values of county-level population density. I explored a number of operationalizations, including (a) quantiles that contained an equal number of Wisconsin residents; (b) categories that contained an equal number of counties; and (c) allocations based upon particular population density thresholds (e.g., 200 people/mi²). As a result of these evaluations, I

created three categories based upon population density quintiles: Milwaukee County (Q1), Urban Counties (Q2/Q3), and Rural Counties (Q4/Q5). Table 1 presents summary characteristics for these groupings.

The first category—“Milwaukee County”—represents the densest quintile; with a population density of almost 4,000 people/mi². It includes Milwaukee—the state's largest city (approximately 600,000 residents)—and a city with a unique social environment (e.g., high rates of poverty, large non-white population) when compared to all other Wisconsin counties. These distinctive attributes could conceivably contribute to a social environment with numerous amenities for older adults that are walkable or accessible by public transportation.

The second category, “Urban Wisconsin Counties” includes counties in the next two most-dense quintiles. These two quintiles share similar characteristics, including mean county population and median household income. As a group, the 11 counties in this category contain (1) the six suburban counties surrounding Milwaukee County, and (b) five additional counties that house the cities of Madison, Green Bay, Appleton, Oshkosh and Lacrosse. In total, these suburban counties and counties with smaller cities represent the wealthiest places in Wisconsin. As such, they may be expected to have more plentiful resources and opportunities of engagement, when compared to more rural counties.

All other Wisconsin counties were classified as “Rural”. The vast majority of counties fall into this category; which had a mean county population of just 40,989. Similar to national trends, Wisconsin older adults are overrepresented in rural counties, compared to the general population. With a mean population density of 56 people/ mi² and a third of these counties losing population between 2000 and 2010, older residents could face greater obstacles when searching for local amenities or social activities.

An advantage of employing this urban-rural typology—particularly as it pertains to social participation—is that small towns in rural counties are not classified as urban; while low-density suburban places that are adjacent to major metropolitan areas are not classified as rural. For example, in 2010 the most populous and dense census tract in one of Wisconsin's least populated counties—Iron County (tract#1801)—contains only 2,514 people, but has a population density of 214 people/mi². At the same time, a suburban census tract in Dane County (tract#11.02) not only has a greater population (8,031) but is just 10 miles from amenity-rich Madison, Wisconsin's second largest city, despite both tracts sharing a similar population density (207 people/mi²).

Methods: Social Participation

This study's operationalization of social participation includes twelve related items from the WLS's “Social and Civic Participation” module, including frequency or level of involvement with:

1. Meeting friends
2. Talking on the phone w/friends
3. Attending art or cultural activities

4. Going to restaurants or bars
5. Light physical activity with others
6. Vigorous physical activity with others
7. Civic groups
8. Community centers
9. Neighborhood improvement organizations
10. Charity or welfare organizations
11. Hobby groups
12. Church or other place of worship

Similar to prior studies, I placed these activities into five categories that measure the individual's level of participatory intensity (Thomas, 2012). These categories ranged from 0 to 1; with the following values and substantive meanings—0 (no participation), 0.25 (low participation), 0.5 (moderate participation), 0.75 (high participation) or 1.0 (very high participation). For items that asked for quantitative responses based upon frequency or hours (items 1 through 6), the activity was coded into categories as suggested by the 2011 WLS codebooks. For example, the five categories for item 1 (frequency meeting friends during the past four weeks) represents “0”, “1-2”, “3-4”, “5-8”, and “9 or more” times, respectively. For items 7 through 12, the five categories were determined by the survey question “How involved were you with [group]?” For these questions, the five categories represent the five possible responses—0 (was not involved), 0.25 (very little), 0.5 (some), 0.75 (quite a bit), or 1.0 (a great deal). For these twelve social participation questions, 67% of the WLS respondents had no missing items, 17% left one or two of these items blank; 14% left three to eleven items blank; and 2% did not answer any social participation questions. I coded missing responses as “0”; and discuss this assumption in the *Sensitivity Analyses* section.

Table 2 displays the proportion of respondents in each substantive category, for each activity; as well as the mean activity score across individuals. For example, the three most popular activities were “going to restaurants/bars”, “talking on the phone”, and “attending church or a place of worship”. Conversely, the least four popular activities were the four “community group” activities (e.g., civic groups, neighborhood improvement groups, community centers, and hobby groups). Since more than 80% of respondents reported no participation for each of these four activities; they are combined into one index for the main analysis. Similarly, both light and heavy group exercise were combined to form an “exercise group” index.

Methods: Self-Rated Health and Correlates

This study employs self-rated health (SRH) as a measure of general health status; since it is widely considered both a valid proxy for health and a predictor of future health outcomes; including morbidity, mortality and perceived health (Jylhä, 2009). SRH is also frequently used as the dependent variable in studies of social capital and health (Kim et al., 2008). In the 2011 WLS, SRH was ascertained by asking “How would you rate your health at the

present time?” with 17% answering “excellent”; 66% answering “good”; 15% “fair”; 2% “poor”; and <1% answering “very poor”. Because so few people reported “very poor” SRH, the latter two categories were combined.

I also include seven other individual-level characteristics that are likely associated with both social participation and older-adult health: age, sex, employment status, marital status, whether or not the respondent lives with a child, educational status, and income. Although the WLS follows a particular graduating class, not all respondents’ ages were equal. In 2011, the respondents’ ages ranged from 69 to 76, with the vast majority (91%) between 70 and 72 years old. Since the entire sample graduated from high school, educational attainment is dichotomized as whether or not the respondent obtained a bachelor’s degree (23%). In order to compare my results to prior studies (Nieminen et al., 2010; Nummela et al., 2009; Poortinga, 2006), I also employ a 3-category variable that represent “low” (0-2.0), “medium” (2.25-4.0) and “high” levels (>4.0) levels of participation; containing 28%, 48% and 24% of respondents, respectively.

Table 3 displays descriptive statistics for the entire sample; while Table 4 presents descriptive statistics by residential categories. Table 4 also denotes whether these characteristics statistically vary across these categories; using urban counties as the reference category. For example, WLS respondents living in Milwaukee County were less likely to be married and more likely to live with a child than those in urban counties. Notably, those living in the rural counties were 30% more likely to report low levels of social participation than those in urban counties. This difference was attributable to relatively lower participation in four activities—going to restaurants, meeting with friends, attending cultural activities, and participating in exercise groups. In addition, WLS respondents living in rural counties were less likely to be college educated than their urban counterparts. Similar to prior work (Putnam et al., 2012), I found religiosity did not differ between rural and urban counties; although it was lower in Milwaukee County.

As part of this analysis, I also examined within-category heterogeneity of social participation; in order to test the assumption of a shared “activity space” at the county-level. More specifically, within each of these residential categories, I analyzed the role of living in designated cities (10,000 residents) verses living in smaller towns and more-rural places. Almost half of the Wisconsin respondents (41.6%) lived in designated cities, which had a mean population density of 2,486 people per square mile. Within each of these three residential categories, I found no significant differences in social participation between those that lived in designated cities, when compared to those that did not.

Methods: Analytic Strategy

I estimate four sets of ordered logistic regression models (i.e., proportional odds models) to test relationships between social participation and SRH. The first set (A) employs the entire WLS sample; while the subsequent sets (B through D) are performed for each of the three residential categories. Each set contains a sequence of three models. Model 1 (M1) includes all individual-level demographic characteristics, as well as a categorical measure of social participation (i.e., “low”, “medium”, and “high”). This model tests whether increasing levels of social participation is associated with health for WLS respondents; as has been found in

most prior studies. Model 2 (M2) substitutes these categories with all 8 social participation activities/indices; helping determine whether or not relationships between social participation and health identified in M1 are primarily attributable to particular activities. Model 3 (M3) replaces current social participation with both prior social participation (2003; 8 years prior) and prior health status. This model evaluates whether social participation for individuals in their early 60s is related to subsequent health almost a decade later.

Results

Tables 5 through 8 present results from the ordered logistical regression models. To ease interpretation, results are displayed as exponentiated coefficients; representing proportional odds ratios. That is, at any reported level of SRH, these numbers represent the lower (for ratios <1.0) or greater (for ratios >1.0) odds of reporting a worse health category, given a one unit increase in that variable.

Table 5 presents results for the entire sample (set A). Comparable to prior studies, incremental levels of social participation were associated with better SRH outcomes in MA-1. In MA-2, six of the eight activities were associated with SRH; although the two most popular activities (going to restaurants/bars; and talking on the phone) were associated with worse SRH (OR=1.31 and OR=1.27, respectively). While four activities were associated with better cross-sectional SRH in MA-2, just three (religious participation, cultural activities and exercise groups) were associated with better subsequent health in MA-3.

Table 6 presents results for those living in Wisconsin urban counties (set B). For these individuals, only high levels (OR=0.48) of social participation were related to SRH in MB-1. In MB-2, relationships between particular social activities and SRH are similar to those found using the entire sample; except talking on the phone was not associated with health for this group. In MB-3, attending restaurants/bars was associated with negative subsequent health outcomes; while no other activities were associated with subsequent health.

Table 7 presents results for those living in rural counties (set C). For this group, both medium and high rates of social participation were associated with health in MC-1. In MC-2, three of the eight activities had associations with health outcomes—meeting friends (OR=0.69), exercise groups (OR=0.56), and charity work (OR=0.55); the first two of which were less popular in rural counties, when compared to urban counties. In MC-3, two activities—religious participation (OR=0.70) and arts/cultural participation (OR=0.64)—were related to better subsequent health for these rural residents.

Table 8 presents separate regression results for those living in Milwaukee County (set D). Although meeting with friends and being involved with an exercise group were associated with better SRH outcomes in the cross-sectional models (MD-2); no social activities were related to subsequent health (MD-3).

Sensitivity Analyses

Despite including numerous social participation activities in Models 2 and 3, I found little concern over multicollinearity. Post-estimation variance inflation factor scores for all social

participation activity variables in M2 (maximum value 2.06) and M3 (maximum value 1.95) were acceptably low; while correlation coefficients between the eight participation measures in these two models were all less than 0.30. To test the sensitivity of my statistical analyses, I performed two additional procedures. One, I imputed missing social participation data using Stata's *mi* command; employing all other covariates used in the primary analysis. Using these simulated datasets (20), parameter values were derived by estimating models using each dataset, averaging the results, and adjusting the variance to account for uncertainty. Two, I performed a set of regression models using a dichotomous indicator of (fair/poor SRH) vs (excellent/good SRH). Results from both of these analyses were essentially the same as those reported in the text.

I also considered the implications of omitting WLS respondents that left Wisconsin. Compared to Wisconsin residents, this group had higher socioeconomic status, greater college graduation rates, and slightly greater social participation scores (mean=3.31)—primarily attributable to greater involvement in community-based groups. Estimating a set of models for non-residents yielded virtually the same results as those presented in the manuscript (set A), with one exception: for non-residents, there was no significant association between attending religious services and health (in either M2 or M3).

As in most longitudinal studies, WLS attrition was more likely among those without college degrees (Herd, 2010); and, consequently, more likely for those with lower rates of social participation. That said, (a) the WLS is recognized for its relatively high survey response rates (Herd et al., 2014), (b) this study's research questions pertain to the selective group of individuals that survived until age 63, and (c) only 300 (6%) of all survey participants died between 2003 and 2011. Since supplemental analyses revealed that relationships between social participation and health identified in the manuscript were slightly more robust for those without a college education, coefficients displayed in the statistical tables are likely conservative.

Discussion

Most prior research studying linkages between place, health, and active aging have focused on neighborhoods within urban cores; drawing little attention to differences between rural and urban places (Annear et al., 2014; Michael & Yen, 2014). This study finds that older adults living in rural counties are less socially engaged than those living in urban ones; and these differences were primarily attributable to three types of social activities—amenity related activities (restaurants, the arts), meeting friends, and exercise groups. It is unclear what role distance plays in these disparities, since museums, an exercise class, or meeting friends might involve a substantial commute for those living in places with low population densities. This does not imply, however, that activity opportunities need to be walkable: 95% of WLS respondents still drive a car, and this did not vary by residential category. Americans—including those at older ages—predominantly use automobiles to travel; and researchers need to consider this as they conceptualize the “local area” or “neighborhood effects” going forward. Due to a reliance on driving, however, this cohort may begin to become more socially restricted as they age through their 70s and 80s; and this remains an important consideration for future studies.

Putnam suggested that American community engagement began to decline around the 1960s—not long after WLS respondents graduated from high school. This study provides some support for his bleak views in that even the tail-end of “The Greatest Generation” may not be very socially engaged. More specifically, WLS respondents reported greater than “low” activity intensity for only four of the twelve activities; two of which may involve little interaction with the community (going to restaurants/bars and talking on the phone). In addition, approximately half of all respondents reported no involvement with either light or heavy group exercise. Low participation levels were even more striking for the four types of community-based groups (e.g. community centers, neighborhood groups); and this is notable since these types of institutions are often considered possible centers of local older adult social activity (Cagney et al., 2013).

Social participation differences between rural and urban contexts found in this study contrasts with prior work using a county-level Social Capital Index developed by Rupasingha and Goetz (2008). That data would assign rural Wisconsin counties essentially the same score (0.77) as the urban counties (0.75); and there are two reasons for this. One, Rupasingha and Goetz's Index included voter turnout and census response rates; which were higher in rural counties. Second, their index focused on per capita measures of *potential* social participation (i.e., physical entities) using U.S. census and business data. Exploring relationships linking the presence of participation-related infrastructure to its actual use by local individuals remains an important next step in this line of research.

Besides testing for rural-urban differences in older adult social participation, this manuscript also tested whether relationships between social participation and health differed by these same domains. Matching expectations—and similar to prior studies of older adults—better health outcomes were associated with *concurrent* social participation for group exercise (Rubenstein et al., 2000), volunteering (Hanlon et al., 2014), meeting friends (Cornwell & Waite, 2009), and religious attendance (Litwin, 2006). Importantly, two of these activities—meeting friends and group exercise—were less popular among older adults living in rural counties; providing some evidence that rural-urban differences in the social environment may have important health implications. Perhaps surprisingly, two social activities (talking on the phone with friends and attending restaurants/bars) were associated with worse health; suggesting that some activities may be more common with people already in poor health. It also provides some support for Putnam's view that social capital itself is not inherently good, and could result in deleterious behavior. In total, these results demonstrate one limitation of social participation indices (i.e., “medium”, “high”) since these categories could obscure negative associations between particular activities and health.

Relationships between social activities and *subsequent* health also differed across space in important ways. One, although religiosity itself differed little between rural and urban counties, the association between religious attendance and health improvement was statistically significant only for those living in rural places. Given the well-established linkages between religiosity and older-adult health (Green & Elliott, 2010), these findings provide some impetus for researchers to further compare these relationships in different residential contexts (e.g., between cities or between regions). I also found that attending art or cultural activities was associated with health improvement only for rural residents.

Although prior research has found positive associations between older-adult wellbeing and taking part in the arts (MacLeod et al., 2016); this study is one of the first I am aware of finding that even attending cultural events may provide some health benefits. Since rural residents reported approximately 50% less involvement in this activity category than urban residents, these findings suggest another important way in which the social environment may contribute to health inequalities between these contexts. Ultimately, it is unclear whether these relatively low rates of participation are due to lack of proximate infrastructure or differences in leisure preferences; and this presents an important consideration for future studies.

Limitations and Conclusion

The WLS is generally representative of white high-school graduates from a particular generation of Americans (Herd et al., 2014). Because of this, it is also limited in its ability to (1) make claims about those with less than a high school education and (2) explore likely racial and ethnic differences in older-adult social participation and health (Winterton & Hulme Chambers, 2016). That said, the relatively homogenous sample of the WLS can help account for unobserved variables associated with race and education that could bias the estimates (Herd, 2010). In addition, 80% of U.S. adults aged 65-plus were non-Hispanic white in 2010; despite the increased ethnic diversity of Americans in younger cohorts.

Since this paper tested relationships between social participation and health, it did not include other items that Putnam argues are important components of declining social capital, such as civic virtue and mutual trust. In addition, it remains to be seen whether Putnam's hypothesized decline in social capital, broadly, applies to subsequent generations *during their older ages*; and whether this differs by rural and urban places. If so, then relationships between social participation and health may also change and become a more vital indicator of healthy aging.

Similar to most research examining relationships between place and health, this study does not account for migration over the life course; and how this may be related to place, health and social participation. That said, WLS residential moves between 2003 and 2011 were relatively rare; and of the 3,006 Wisconsin resident respondents in 2011, only 65 (2%) lived in another state in 2003. Lastly, the ability to make causal claims in this study—even with lagged measures of health and participation—are limited. For example, a respondent's self-reported health status and/or activity participation may have fluctuated multiple times between 2003 and 2011.

Despite this study's limitations, my findings provide some insight into how the social environment—and its health implications for older adults—may differ between rural and urban contexts. This is valuable, given increased attention to the geographies of ageing (Skinner et al., 2014), and the fact that social participation is widely considered to be modifiable health risk factor (Levasseur et al., 2010). This study can also begin to inform decisions on the usefulness of programs that promote or invest in engaging environments for older adults. As the number and proportion of older individuals is projected to keep rising worldwide—and the majority of older individuals will age in place—it will become

increasingly important to understand ways in which the “aging experience” differs between places.

Acknowledgments

Funding:

This work was supported by a grants from the National Institute on Aging (5T32AG000129) and the National Institute of Health (R24 HD047873) and (P30 AG017266).

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Highlights

- Explored rural-urban differences in social participation and health relationships.
- These relationships varied by social activity and by rural-urban context.
- Those in rural counties were less socially active than their urban counterparts.
- In rural counties, religion and the arts were associated with subsequent health.

Table 1
Wisconsin County Characteristics by Population Density Quintiles, 2010 Census

Category	County Mean Density, people/mi ² (Mean)	Number of Counties	Total Population	% Wisconsin Total Population	% Wisconsin 65-plus Population	Cities >75,000	County Population (Mean)	Median County HH Income (Mean)	Lost Population 2000-2010 (Count)
Milwaukee County (Q1) Urban Counties:	3,926	1	947,735	17%	14%	1	947,735	\$43,215	-
High Density	594	4	999,732	18%	17%	3	249,933	\$58,976	-
(Q2) Urban Counties:	318	7	1,280,189	23%	18%	1	182,884	\$58,185	-
Medium Density									
(Q3) Rural Counties:	127	14	1,247,771	22%	22%	-	89,127	\$53,275	2
Low Density									
(Q4) Rural Counties:	34	45	1,207,327	21%	29%	-	28,829	\$44,601	17
Lowest Density									
(Q5) Wisconsin: Total ^a		71	5,682,754	100%	100%	5	80,039	\$52,600	19

^aMenominee County, essentially a Native-American reservation (2010 population=4,322) is excluded from the sample.

Table 2

Proportion Reporting Different Levels of Social Participation, 2011 Wisconsin Longitudinal Survey,
Wisconsin Residents (n=3,006)

	“None”	“Low”	“Moderate”	“High”	“Very High”	Mean
Go to Restaurants/Bars	0.12	0.21	0.20	0.19	0.28	0.58
Talking on Phone	0.10	0.31	0.21	0.21	0.17	0.51
Church/Place of Worship	0.28	0.10	0.19	0.23	0.20	0.49
Meet w/ Friends	0.20	0.30	0.25	0.16	0.09	0.41
Arts/Cultural	0.54	0.12	0.14	0.11	0.09	0.28
Charity/Welfare Orgs	0.69	0.12	0.12	0.05	0.03	0.15
Light Group Exercise	0.53	0.19	0.09	0.10	0.08	0.25
Heavy Group Exercise	0.81	0.05	0.05	0.04	0.05	0.12
Hobby Groups	0.81	0.06	0.07	0.04	0.01	0.09
Community Centers	0.84	0.07	0.06	0.02	0.01	0.07
Neighborhood Imp. Groups	0.85	0.07	0.05	0.02	0.01	0.06
Civic Groups	0.87	0.04	0.05	0.02	0.01	0.06
Total						3.07

Table 3

Descriptive Statistics, 2011 Wisconsin Longitudinal Survey, Wisconsin Residents (n=3,006)

	Sample
Current Self-Rated Health (%):	
Excellent	16.9
Good	65.8
Fair	14.8
Poor/Very Poor	2.5
Prior (2003) Self-Rated Health (%):	
Excellent	20.3
Good	65.8
Fair	12.5
Poor/Very Poor	1.4
Mean (sd), Age	71.2 (0.92)
Male (%)	46.2
Employed (%)	29.4
Married (%)	74.6
Live with Child (%)	8.9
Bachelor's Degree (%)	23.2
Household Income, Median (%)	\$32,464
Social Participation (%):	
Low	28.4
Medium:	47.9
High:	23.7
County Residential Category (%):	
Urban Counties	39.1
Rural Counties	52.4
Milwaukee County	8.5

Table 4

Descriptive Statistics and Bivariate Analysis by Residential Categories, 2011 Wisconsin Longitudinal Survey, Wisconsin Residents (n=3,006)

y	Urban Counties ^a	Rural Counties	Milwaukee County
2011 SRH (1-4; 1=Excellent)	1.98	2.05 *	2.10 *
2003 SRH (1-4; 1=Excellent)	1.91	1.98 *	1.95
Age (Mean)	71.2	71.2	71.2
% Male	45.5%	47.5%	41.6%
% Employed	28.3%	30.3%	28.8%
% Married	75.2%	76.6%	59.5% *
% Live with Child	8.5%	8.6%	11.7% *
% Highest Income Quintile	16.9%	15.7%	17.5%
% Bachelor's Degree	26.2%	20.0% *	28.0%
Social Participation=Low	24.2%	31.8% *	26.8%
2011 Social Participation, count	3.20	2.96 *	3.13
Components, (range)			
Restaurants w/friends (0-1)	0.60	0.55 *	0.62
Talk on Phone (0-1)	0.52	0.50	0.50
Church/worship (0-1)	0.49	0.51	0.41 *
Meet w/ Friends (0-1)	0.43	0.39 *	0.41
Arts/Cultural (0-1)	0.32	0.23 *	0.35
Charity/Welfare (0-1)	0.15	0.15	0.14
Exercise Groups (0-2)	0.41	0.33 *	0.43
Community Groups (0-4)	0.28	0.30	0.29
2003 Social Participation, count	3.43	3.22 *	3.39
n	1,175	1,574	257

* Statistically different from the reference category at p 0.05 (two-tailed test).

^aReference category.

Table 5

Odds Ratios of Reporting a Worse Self-Rated Health Category. Ordered Logistic Regression. Set A: Wisconsin Longitudinal Study, Wisconsin Residents

	Wisconsin Longitudinal Study					
	MA-1		MA-2		MA-3	
	OR	(SE)	OR	(SE)	OR	(SE)
Age (1 additional year)	1.09 [*]	(0.05)	1.09 [*]	(0.05)	1.08	(0.05)
Male	1.15	(0.08)	1.19 [*]	(0.10)	1.08	(0.10)
Currently Employed	0.82 [*]	(0.07)	0.79 ^{**}	(0.07)	0.89	(0.08)
Married	0.89	(0.08)	0.89	(0.08)	1.05	(0.08)
Live with Child	1.37 [*]	(0.18)	1.31 [*]	(0.18)	1.24	(0.18)
Obtained Bachelor's Degree	0.63 ^{***}	(0.06)	0.65 ^{***}	(0.06)	0.72 ^{***}	(0.08)
Income (ref="Lowest Income Quintile")						
Quintile 2	1.10	(0.14)	1.10	(0.14)	1.21	(0.16)
Quintile 3	0.94	(0.12)	0.97	(0.12)	1.08	(0.14)
Quintile 4	0.96	(0.12)	0.99	(0.13)	1.10	(0.15)
Quintile 5 (highest income)	0.76 [*]	(0.11)	0.78	(0.11)	0.98	(0.15)
2011 Social Participation: Medium ^a	0.77 ^{**}	(0.07)				
2011 Social Participation: High ^a	0.44 ^{**}	(0.05)				
2011 Social Participation:						
Restaurants/Bars			1.31 [*]	(0.16)		
Talk on Phone w/ friends			1.27 [*]	(0.17)		
Church or worship			0.79 [*]	(0.09)		
Meet w/ Friends			0.63 ^{***}	(0.06)		
Arts/Cultural			0.87	(0.11)		
Charity/Welfare			0.60 ^{***}	(0.10)		
Exercise Groups			0.55 ^{***}	(0.05)		
Community Groups			0.92	(0.09)		
2003 Social Participation:						
Restaurants/Bars w/ friends					1.12	(0.15)
Talk on Phone					0.95	(0.14)
Church or worship					0.74 [*]	(0.09)
Meet w/ Friends					0.92	(0.14)
Arts/Cultural					0.78 [*]	(0.10)
Charity/Welfare					0.96	(0.16)
Exercise Groups					0.81 [*]	(0.07)

	Wisconsin Longitudinal Study					
	MA-1		MA-2		MA-3	
	OR	(SE)	OR	(SE)	OR	(SE)
Community Groups					0.97	(0.09)
2003 SRH					8.77 ^{***}	(0.65)
Log Likelihood	-2776		-2745		-2286	
AIC	5,581		5,533		4,613	
N	3,006		3,006		3,006	

^{***}
p 0.001

^{**}
p 0.01

^{*}
p 0.05 (two tailed test).

^a
reference=low

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Table 6

Odds Ratios of Reporting a Worse Self-Rated Health Category. Ordered Logistic Regression. Set B: Wisconsin Urban County Residents

	Wisconsin Urban Counties					
	MB-1		MB-2		MB-3	
	OR	(SE)	OR	(SE)	OR	(SE)
Age (1 additional year)	1.00	(0.07)	0.99	(0.07)	1.00	(0.08)
Male	1.23	(0.16)	1.29	(0.18)	0.96	(0.15)
Currently Employed	0.78	(0.11)	0.76 [*]	(0.11)	0.82	(0.12)
Married	1.02	(0.15)	1.04	(0.16)	1.31	(0.21)
Live with Child	1.44	(0.31)	1.28	(0.28)	1.27	(0.31)
Obtained Bachelor's Degree	0.60 ^{***}	(0.09)	0.57 ^{***}	(0.09)	0.64 ^{**}	(0.11)
Income (ref="Lowest Income Quintile")						
Quintile 2	1.00	(0.21)	1.00	(0.21)	0.96	(0.22)
Quintile 3	0.78	(0.16)	0.80	(0.16)	0.86	(0.19)
Quintile 4	0.87	(0.18)	0.90	(0.19)	0.99	(0.22)
Quintile 5 (highest income)	0.75	(0.17)	0.78	(0.18)	1.05	(0.26)
2011 Social Participation: Medium ^a	1.03	(0.16)				
2011 Social Participation: High ^a	0.48 ^{***}	(0.09)				
2011 Social Participation:						
Restaurants/Bars			1.69 ^{**}	(0.34)		
Talk on Phone w/ friends			1.47	(0.33)		
Church or worship			0.70 [*]	(0.12)		
Meet w/ Friends			0.61 [*]	(0.14)		
Arts/Cultural			0.94	(0.18)		
Charity/Welfare			0.54 ^{**}	(0.14)		
Exercise Groups			0.55 ^{***}	(0.07)		
Community Groups			0.89	(0.14)		
2003 Social Participation:						
Restaurants/Bars					1.65 [*]	(0.37)
Talk on Phone w/ friends					0.90	(0.23)
Church or worship					0.73	(0.12)
Meet w/ Friends					0.77	(0.15)
Arts/Cultural					0.92	(0.19)
Charity/Welfare					0.88	(0.24)
Exercise Groups					0.81	(0.12)
Community Groups					0.81	(0.12)
2003 SRH					11.20 ^{***}	(1.39)

	Wisconsin Urban Counties					
	MB-1		MB-2		MB-3	
	OR	(SE)	OR	(SE)	OR	(SE)
Log Likelihood	-1054		-1040		-829	
AIC	2,138		2,121		1,701	
N	1,175		1,175		1,175	

p 0.001

**

p 0.01

*

p 0.05 (two tailed test).

^a

reference=low

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Table 7

Odds Ratios of Reporting a Worse Self-Rated Health Category. Ordered Logistic Regression. Set C: Wisconsin Rural County Residents

	Wisconsin Rural Counties					
	MC-1		MC-2		MC-3	
	OR	(SE)	OR	(SE)	OR	(SE)
Age (1 additional year)	1.16 [*]	(0.07)	1.16 [*]	(0.07)	1.13 [*]	(0.07)
Male	1.15	(0.13)	1.20	(0.14)	1.20	(0.15)
Currently Employed	0.76 [*]	(0.09)	0.74 ^{**}	(0.09)	0.85	(0.11)
Married	0.95	(0.12)	0.92	(0.12)	1.07	(0.15)
Live with Child	1.40	(0.27)	1.38	(0.26)	1.44	(0.28)
Obtained Bachelor's Degree	0.66 ^{**}	(0.09)	0.73 [*]	(0.10)	0.79	(0.12)
Income (ref="Lowest Income Quintile")						
Quintile 2	1.14	(0.19)	1.15	(0.19)	1.37	(0.24)
Quintile 3	1.04	(0.18)	1.10	(0.18)	1.27	(0.23)
Quintile 4	1.04	(0.18)	1.08	(0.19)	1.19	(0.22)
Quintile 5 (highest income)	0.71	(0.14)	0.75	(0.15)	0.95	(0.20)
2011 Social Participation: Medium ^a	0.71 ^{**}	(0.09)				
2011 Social Participation: High ^a	0.45 ^{***}	(0.07)				
2011 Social Participation:						
Restaurants/Bars			1.02	(0.17)		
Talk on Phone w/ friends			1.19	(0.21)		
Church or worship			0.89	(0.13)		
Meet w/ Friends			0.69 [*]	(0.14)		
Arts/Cultural			0.81	(0.15)		
Charity/Welfare			0.55 ^{**}	(0.13)		
Exercise Groups			0.56 ^{***}	(0.07)		
Community Groups			0.96	(0.12)		
2003 Social Participation:						
Restaurants/Bars					0.85	(0.16)
Talk on Phone w/ friends					1.07	(0.21)
Church or worship					0.70 [*]	(0.12)
Meet w/ Friends					1.10	(0.23)
Arts/Cultural					0.64 [*]	(0.12)
Charity/Welfare					0.87	(0.21)
Exercise Groups					0.83	(0.11)
Community Groups					1.16	(0.14)
2003 SRH					7.98 ^{***}	(0.81)

	Wisconsin Rural Counties					
	MC-1		MC-2		MC-3	
	OR	(SE)	OR	(SE)	OR	(SE)
Log Likelihood	-1468		-1456		-1233	
AIC	-2,967		-2,954		2,510	
N	1,574		1,574		1,574	

p 0.001

**

p 0.01

*

p 0.05 (two tailed test).

^a

reference=low

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Table 8

Odds Ratios of Reporting a Worse Self-Rated Health Category. Ordered Logistic Regression. Set D: Milwaukee County Residents.

	Milwaukee County Residents					
	MD-1		MD-2		MD-3	
	OR	(SE)	OR	(SE)	OR	(SE)
Age (1 additional year)	1.17	(0.15)	1.18	(0.23)	1.25	(0.23)
Male	0.78	(0.21)	0.78	(0.15)	0.73	(0.15)
Currently Employed	1.44	(0.43)	1.58	(0.49)	1.59	(0.49)
Married	0.43**	(0.13)	0.43**	(0.13)	0.58	(0.13)
Live with Child	1.06	(0.43)	0.86	(0.36)	0.59	(0.36)
Obtained Bachelor's Degree	0.60	(0.19)	0.53*	(0.17)	0.73	(0.17)
Income (ref="Lowest Income Quintile")						
Quintile 2	1.31	(0.53)	1.46	(0.61)	1.45	(0.61)
Quintile 3	1.47	(0.64)	1.33	(0.59)	1.21	(0.59)
Quintile 4	1.05	(0.44)	0.96	(0.42)	0.88	(0.42)
Quintile 5 (highest income)	0.97	(0.46)	0.82	(0.41)	0.91	(0.41)
2011 Social Participation: Medium ^a	0.41**	(0.14)				
2011 Social Participation: High ^a	0.35**	(0.13)				
2011 Social Participation:						
Restaurants/Bars			2.04	(0.86)		
Talk on Phone w/ friends			0.78	(0.37)		
Church or worship			0.80	(0.31)		
Meet w/ Friends			0.31*	(0.31)		
Arts/Cultural			1.11	(0.44)		
Charity/Welfare			1.82	(1.16)		
Exercise Groups			0.44**	(0.12)		
Community Groups			0.70	(0.24)		
2003 Social Participation:						
Restaurants/Bars					1.68	(0.81)
Talk on Phone w/ friends					0.39	(0.20)
Church or worship					1.39	(0.60)
Meet w/ Friends					0.50	(0.26)
Arts/Cultural					0.89	(0.36)
Charity/Welfare					1.28	(0.80)
Exercise Groups					0.67	(0.20)
Community Groups					0.81	(0.27)
2003 SRH					6.78***	(1.84)
Log Likelihood		-233		-226		-198

	Milwaukee County Residents					
	MD-1		MD-2		MD-3	
	OR	(SE)	OR	(SE)	OR	(SE)
AIC	497		495		439	
N	257		257		257	

p 0.001

**
p 0.01

*
p 0.05 (two tailed test).

^areference=low

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