

City Governments and Aging in Place: Community Design, Transportation and Housing Innovation Adoption

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Purpose of the study: To examine the characteristics associated with city government adoption of community design, housing, and transportation innovations that could benefit older adults. **Design and methods:** A mixed-methods study with quantitative data collected via online surveys from 62 city planners combined with qualitative data collected via telephone interviews with a subsample of 18 survey respondents. **Results:** Results indicate that advocacy is an effective strategy to encourage city government adoption of these innovations. Percent of the population with a disability was positively associated, whereas percent of the population aged 65 and older was not associated or negatively associated, with innovation adoption in the regression models. Qualitative interviews suggest that younger individuals with disabilities are more active in local advocacy efforts. **Implications:** Results suggest that successful advocacy strategies for local government adoption include facilitating the involvement of older residents, targeting key decision makers within government, emphasizing the financial benefits to the city, and focusing on cities whose aging residents are vulnerable to disease and disability.

Key Words: Aging in place, Advocacy, Public policy, Mixed methods

well-being, and the ability to age in place. These include community design that separates residential and commercial areas (Handy, 2005), the absence of adequate alternative transportation services (Rosenbloom & Herbel, 2009), and limited accessible housing (Maisel, Smith, & Steinfeld, 2008). Recent studies (e.g., AARP Public Policy Institute, 2005) suggest an emerging consensus regarding the innovative policies and programs needed to address these physical barriers, including the following: (a) zoning and infrastructure changes that could allow older adults to remain connected to their community, (b) developing a range of transportation services and mobility options, and (c) creating a wide variety of housing supports and choices. City governments often provide services that may help older adults age in place, including senior centers, recreation programs, and social services. However, there are no previous studies that have explored city government adoption of policies that address the impact of the physical environment on older adults. Informed by an internal determinants and diffusion framework, there are two aims of this mixed-methods study. The first is to examine the characteristics associated with city government adoption of community design, housing, and transportation innovations that affect older adults. The second is to use qualitative interviews to

The physical environment of many cities in the United States presents barriers to elder health,

explain the quantitative findings and provide additional findings around the process of adopting these innovations.

A growing interest in adapting the physical environment of communities to better meet the needs of older adults is a reaction to a confluence of factors, including the aging of the U.S. population, a projected increase in disability and chronic disease in future cohorts of older adults, and an inadequate long-term care system. Due to the aging of the Baby Boomer generation and increased longevity, by the middle of the 21st century, a projected 88.5 million Americans will be aged 65 and older (U.S. Census Bureau, 2009). Although the percentage of older adults with a disability decreased in recent years (Crimmins, 2004), the 85 and older population, whose members experience a greater incidence of functional and cognitive impairment, is expected to triple over the next 40 years (U.S. Census Bureau, 2008). In addition, research indicates an increase in chronic illness among Baby Boomers compared with the previous cohort (Martin, Freedman, Schoeni, & Andreski, 2009), suggesting that improvements in morbidity and disability rates will reverse in the near future. The growing number of older adults who require assistance with functioning will rely on a U.S. long-term care system characterized by high costs (Komisar & Thompson, 2007), unmet need (Zarit, Shea, Berg, & Sundstrom, 1998), and poor quality (U.S. Government Accountability Office, 2005). Further, even as 93% of older adults want to remain in their own homes (Feldman, Oberlink, Simantov, & Gursen, 2004) and governments attempt to reduce long-term care costs and increase the supply of community-based services, public reimbursement continues to favor institutional care (Harrington, Ng, Kaye, & Newcomer, 2009).

Physical Environments and Elder Health and Well-being

Community Design.—In recent decades, the percentage of older adults living outside of cities has steadily increased, and a majority of elders today are suburbanites (Frey, 1999). Thus, many older adults live in communities characterized by the separation of commercial and residential areas, creating a situation in which access is severely restricted for those who no longer operate their own vehicle. The distances between residential and commercial areas, combined with the absence of sidewalks in many suburban neighborhoods,

discourages walking as a mode of transportation or physical activity.

Research suggests that zoning and infrastructure changes can positively affect the health and well-being of community residents. First, mixed-use and walkable neighborhoods can help individuals maintain or increase their life space (Beard, Blaney, Cerda, Frye, Lovasi, Ompad, Rundle, & Vlahov, 2009), thereby improving access to goods and services. Second, residents of neighborhoods with a variety of walking destinations score higher on measures of social capital (Leyden, 2003). Third, mixed-use and walkable neighborhoods are related to increased physical activity (Berke, Koepsell, Moudon, Hoskins, & Larson, 2007) and decreased limitations of instrumental activities of daily living (IADL; Freedman, Grafova, Schoeni, & Rogowski, 2008).

Transportation.—The majority of older adults get around their communities in a car, with 75% as the driver and 18% as a passenger (Feldman et al., 2004). Impairments such as reduced cognitive functioning, however, hamper the ability of many older adults to drive safely (Lynott et al., 2009). Older nondrivers make 15% fewer trips for medical appointments and 65% fewer trips for religious, social, or community activities compared with their driving counterparts (U.S. Government Accountability Office, 2004). Policies and programs that help older adults continue to safely operate their own vehicle, such as improving the visibility of street signs and simplifying intersections, could positively affect elder health and well-being. Approximately 33% of older adults do not have public transportation in their communities (Rosenbloom & Herbel, 2009), and many that do experience inadequate service that is viewed as unsafe, unresponsive, and inconvenient (Adler & Rottunda, 2006). Complementary paratransit services mandated by the Americans with Disabilities Act of 1990 address the mobility needs of some elders (Koffman, Raphael, & Weiner, 2004), although eligibility criteria mean that approximately 40% of older adults with a disability do not qualify for these services (Rosenbloom, 2009). A recent study found that the negative impact of driving cessation on elder well-being can be avoided if transportation needs are met through other modes of travel (Cvitkovich & Wister, 2003), suggesting that alternative transportation services, such as senior vans, can benefit elders.

Housing.—The cost of maintaining a home presents a significant barrier to aging in place, and in a recent survey more than 50% of older respondents reported spending more than 30% of their income on housing (Feldman et al., 2004). Further, the majority of housing in the United States includes design features that make it inaccessible to individuals with disabilities (Maisel et al., 2008). Federal laws such as the Fair Housing Amendments of 1988 mandate the inclusion of accessible features (i.e., wide entrances and interior doors, accessible light switches) in new multifamily housing (Kochera, 2002), but do not address accessibility in single-family homes or small multifamily buildings (American Planning Association, 2006). In addition, regulatory barriers such as restrictions for converting a garage into a dwelling unit not only keep densities low but also limit the housing options of older adults (Rosenthal, 2009). For example, in many communities zoning ordinances prevent the development of accessory dwelling units (ADUs; Pollack, 1994), an attached or detached permanent structure located on the same lot as a single-family home that includes a private kitchen and bathroom. For older adults who need to downsize because of financial or physical functioning reasons (e.g., difficulty climbing stairs), ADUs serve as an alternative form of housing, whereas for older adults who can remain in their own home but require some financial or personal care support, adding their own ADU creates a rental unit or a living space for a caregiver (Pynoos, Nishita, Cicero, & Caraviello, 2008).

Changing the home environment is associated with improved outcomes for individuals with a disability (Wahl, Fange, Oswald, Gitlin, & Iwarsson, 2009). Incorporating accessibility features is associated with a lower risk of health problems (Liu & Lapane, 2009), slower decline in IADL independence (Gitlin, Corcoran, Winter, Boyce, & Hauck, 2001), and reduced health care expenses (Stearns et al., 2000).

Purpose of the Study

As described earlier, there is growing evidence that community design, transportation, and housing innovations can have a positive impact on elder health, well-being, and the ability to age in place. However, there is little evidence as to why city governments may institute these policies and programs. To begin to address this gap in the literature, this study examined city government adoption

of 11 innovations by testing 3 hypotheses informed by an internal determinants and diffusion framework. In addition, this study used qualitative interviews to explain the quantitative findings and provide additional findings around the process of adopting these innovations.

A combined internal determinants and diffusion framework is often used to guide investigations into the process of adopting an innovation, defined as a program or policy that is new to the adopting unit (Berry & Berry, 1999; Walker, 1969). Diffusion models propose that governments adopt innovations because they are influenced by other governments; policymakers often must devise solutions to problems quickly within the context of limited resources and therefore look to others as they determine the appropriate policy response (Colvin, 2006). Internal determinants models propose that factors within a government jurisdiction, such as community characteristics, determine whether the government will adopt innovations (Berry & Berry). The author selected this framework because it has been applied to previous investigations of the adoption of policy agendas rather than only one specific policy (e.g., Walker), has been used in research on local government innovations (e.g., Shipan & Volden, 2005), and allows flexibility in terms of the specific internal characteristics influencing policy adoption.

This study tested three hypotheses informed by previous studies using an internal determinants and diffusion framework. The first hypothesis, based on the ideas of Berry and Berry (1999), is three diffusion factors will be positively associated with the adoption of these innovations. First, because uncertainty regarding the potential impact of an innovation can be overcome by observing its effects in nearby jurisdictions, governments will adopt innovations that are perceived as being beneficial elsewhere. Second, governments want to gain a competitive advantage to, for example, attract high-income households to increase their tax base, and therefore adopt policies that have popular support in other jurisdictions. Third, governments are more likely to adopt innovations when citizens advocate for these changes.

The second hypothesis is five community characteristics will be positively associated with the adoption of these innovations. In previous studies, larger total population and higher socioeconomic status of the population have positively influenced innovation adoption (Shipan & Volden, 2005; Walker, 1969). In the United States, recognition of

older adults as a distinct social group that deserves special consideration in matters of public policy dates back to the passage of the Social Security Act of 1935 (Elder & Cobb, 1984). Therefore, the percent of older adults living in the community could be associated with the adoption of these innovations. Further, many of these innovations are designed for those who have a physical disability, suggesting the inclusion of the percent of the adult population with a disability.

The third hypothesis is two government characteristics will be positively associated with innovation adoption. First, higher per capita government spending may be a proxy for fiscal health, and local governments that are in poor fiscal health may be more conservative than innovative, particularly in terms of innovations that require a commitment of financial resources (Wolman, 1986). Second, policy entrepreneurs, or those who work within government to promote and advocate for policy innovations (e.g., elected officials), may be particularly influential in terms of increasing awareness and consideration of innovations (Mintrom, 1997).

Methods

This study used a sequential explanatory mixed-methods design, which involves a larger quantitative study followed by a smaller qualitative study (Creswell & Plano Clark, 2007). As this is the first study to examine the factors that influence the adoption of these specific innovations, the use of both quantitative and qualitative methods provided a more in-depth understanding of this topic. Qualitative interviews also allowed the author to expand beyond the quantitative findings to collect information that would be difficult to capture using a more structured online survey, including the process of innovation adoption.

The University of California Berkeley Committee for the Protection of Human Subjects classified this study as exempt from Institutional Review Board approval.

Quantitative Phase

Sample and Data Collection Procedures.—The sample for this study included all 101 cities located in the San Francisco Bay Area. City governments were selected because they have jurisdiction over the use of land, including aspects of community design, housing, and transportation (Feldstein, 2007).

Primary data were collected via online surveys developed by the author. Following a small pilot of the survey, the author sent an invitation to participate via electronic mail to the director of city planning in each city. Survey data collection took place between March and August of 2009. A total of 62 of 101 (61.4%) city planners returned completed surveys, and these data were combined with secondary data from the 2000 U.S. Census and the California 2000 *Cities Annual Report*.

Measures.—Table 1 describes the measures and distribution of the dependent and independent variables. For the dependent variables, the survey asked respondents if their city had adopted the 11 community design, transportation, and housing innovations shown in the table. Due to the distribution of frequencies, the community design outcome was dichotomized to compare cities with both innovations to those with one or none. Transportation, housing, and total number of innovations were measured as count variables.

For the independent variables, the survey asked respondents whether they had knowledge of benefits of these innovations in other jurisdictions, believed other cities gained an advantage by adopting these innovations, experienced public advocacy to adopt these innovations, and if there was an individual within government advocating for adoption. Data on community characteristics were obtained from the 2000 U.S. Census (the most recent year that included all necessary data for cities in the sample), and the California 2000 *Cities Annual Report* provided information on per capita government spending. Population size was coded into categories of less than 50,000 versus 50,000 or more, a demarcation of small and large cities used by federal agencies (e.g., the Office of Management and Budget) and professional organizations (e.g., National League of Cities). Due to problems with functional form, the author transformed continuous variables for community characteristics into dichotomous variables using median splits.

Statistical Analysis.—The author calculated four different regression equations to examine the association between internal determinants and diffusion factors and innovation adoption. Tolerance and variance inflation factor results indicated that multicollinearity is not a concern with independent variables. Logistic regression was used to estimate

odds ratios for the dichotomous outcome variable of community design innovations. Poisson regression was used to analyze the other three outcome variables (i.e., transportation, housing, and total number of innovations) as these measured counts of the number of innovations adopted. As recommended by Cameron and Trivedi (2009), robust standard errors for the parameter estimates were obtained to adjust for minor underdispersion.

Qualitative Phase

Sample and Data Collection Procedures.—After completing the survey, 28 city planners indicated their willingness to participate in a follow-up interview. Ten interview participants were selected using maximum variation sampling, which allows the researcher to explore phenomena using cases that vary by characteristics (Sandelowski, 2000). The author selected interview participants representative of community characteristics (e.g., high and low education, high and low income, high and low percent of the population 65 and older, high and low percent of the population with a disability) and a range in the total number of innovations adopted. The researcher conducted, recorded, and transcribed the interviews in November and December of 2009. Interviewees were asked about the decision process involved in adopting innovations, including how the idea developed and facilitators of and barriers to adoption.

Data Analysis.—Following the recommendation of Miles and Huberman (1984), qualitative data analysis consisted of three concurrent activities: data reduction, data display, and conclusion drawing/verification. Analysis of interview data was informed by previous research but was also inductive in nature, with data reduction starting at the basic level of line-by-line coding (Padgett, 1998). Following the first review of all interview transcripts, the researcher developed initial codes, which were refined after multiple iterations through the data. During data display, the researcher created spreadsheets for each code that included direct quotes as well as data from the online surveys (i.e., community characteristics and specific innovations adopted by the local government of the interview participant). This visual display allowed the researcher to further refine codes, establish a set of themes expressed by multiple interview participants, and draw conclusions about the data. The researcher then verified conclusions by a final review of the interview transcripts, a

procedure that has been used by other qualitative researchers to determine the validity of qualitative data analysis (Miles & Huberman).

Results

Quantitative

Table 2 presents the results of the regression of internal determinants and diffusion factors on innovation adoption. Model 1 presents the logistic regression for the adoption of community design innovations. Cities that experienced public advocacy or had a higher percent of the population with a disability had an increased odds of adopting both community design innovations. However, these results should be interpreted with caution as wide confidence intervals indicate problems with the precision of the model.

Model 2 presents the regression of the number of transportation innovations, and public advocacy was significantly associated with innovation adoption. As shown in Model 3, cities with a higher percent of the population aged 65 and older adopted fewer housing innovations and those with a higher percent of the population with a disability adopted more housing innovations. In Model 4, which presents the regression of the total number of innovations, the relationship between percent of the population with a disability and innovation adoption was also significant. In addition, higher per capita government spending was negatively associated with innovation adoption, whereas the existence of a policy entrepreneur was positively associated with innovation adoption.

Qualitative

Qualitative interviews uncovered potential explanations for the quantitative findings and also additional findings. Three concepts were identified through analysis of the qualitative interviews: advocacy and public resistance, disability and age, and city and resident economic resources.

Advocacy and Public Resistance.—Advocacy by city residents was described as a facilitator of the adoption process. According to one city planner, “Every large project had its genesis with some sort of citizens’ group that came to the city with a concept and got that to move forward.” Another said, “We respond to things we’re pushed to do.” A third city government respondent reported that “Activists

Table 1. Description of Measures and Sample (*N* = 62)

Variables	Description	Frequency (%)
Dependent variables		
Community design	0: zero or one innovation adopted	22 (35.5)
• Incentives to encourage mixed-use neighborhoods	1: Both innovations adopted	40 (64.5)
• Changes in infrastructure to improve walkability		
Transportation (range: 0–5)	0	13 (21.0)
• Education programs for older drivers	1	18 (29.0)
• Assessment programs for older drivers	2	25 (40.3)
• Infrastructure changes to improve older driver safety	3	5 (8.1)
• Alternative transportation	4	1 (1.6)
• Slower-moving vehicle ordinance	5	0
Housing (range: 0–4)	0	0
• Accessory dwelling unit ordinance	1	15 (24.2)
• Developer incentives to guarantee housing units for seniors	2	19 (30.6)
• Incentives to make housing accessible	3	15 (24.2)
• Home modification assistance	4	13 (21.0)
Total number of innovations (range: 0–11)	0	0
	1	2 (3.2)
	2	4 (6.5)
	3	4 (6.5)
	4	5 (8.0)
	5	17 (27.4)
	6	12 (19.4)
	7	11 (17.7)
	8	5 (8.1)
	9	2 (3.2)
	10	0
	11	0
Independent variables		
Diffusion factors		
Benefits	0: No knowledge of benefits in other jurisdictions	7 (11.3)
	1: Knowledge of benefits in other jurisdictions	55 (88.7)
Advantage	0: Does not believe other cities gained an advantage by adopting innovations	15 (24.2)
	1: Does believe other cities gained an advantage by adopting innovations	47 (75.8)
Public advocacy	0: Has not experienced public advocacy from residents to adopt innovations	18 (29.0)
	1: Has experienced public advocacy from residents to adopt innovations	44 (71.0)
Community characteristics		
Size (range: 2,125–776,733)	0: Population size <50,000	42 (67.7)
	1: Population size ≥50,000	20 (32.3)
Education (range: 48.2%–98.8%)	0: Percent of the population with a high school diploma ≤89	31 (50.0)
	1: Percent of the population with a high school diploma >89	31 (50.0)
Income (range: 37,184–200,001)	0: Household median income ≤67,352	31 (50.0)
	1: Household median income >67,352	31 (50.0)

(Table continues on next page)

Table 1. (Continued)

Variables	Description	Frequency (%)
65+ (range: 5.1%–45.1%)	0: Percent of the population aged 65 and older \leq 11.1	31 (50.0)
	1: Percent of the population aged 65 and older $>$ 11.1	31 (50.0)
Disability (range: 8.5%–25.5%)	0: Percent of the adult population with a disability \leq 15.2	31 (50.0)
	1: Percent of the adult population with a disability $>$ 15.2	31 (50.0)
Government characteristics		
Spending (range: 294–6,550)	0: City per capita government spending \leq 1,013	31 (50.0)
	1: City per capita government spending $>$ 1,013	31 (50.0)
Policy entrepreneur	0: No individual within government has advocated for innovation adoption	28 (45.2)
	1: An individual within government has advocated for innovation adoption	34 (54.8)

come to public meetings and they share info about their needs. It is clear what they want: they call me and they definitely call their council people.”

Public resistance, often discussed as concerns about mixed-use neighborhoods and higher-density development, is perceived by city planners as a barrier to adopting these innovations. One city planner referred to “the traditional NIMBY [not in my backyard] people.” Another interviewee noted “There are parts of town where people don’t want more dense neighborhoods . . . People prefer single-family homeownership.” Another planner recalled resistance to an accessible apartment building: “The

concerns raised were about how it would affect parking in the neighborhood and wanting to make sure it would be well managed and well designed.”

Disability and Age.—Several interviewees mentioned advocacy by and on behalf of younger individuals with disabilities. One planner explained, “When we built more accessible housing, it wasn’t seniors per se, but a disability group pushed the city. The basic idea was ‘why are you spending all this money to keep people in institutions when you could keep people in their homes?’” Another interview participant noted the increased visibility of individuals

Table 2. Regression Results for the Adoption of Community Design, Transportation, and Housing Innovations ($N = 62$)

Internal determinants and diffusion variable	Model 1 ^a : community design, OR (95% CI)	Model 2 ^b : transportation, B (95% CI)	Model 3 ^b : housing, B (95% CI)	Model 4 ^b : total number of innovations, B (95% CI)
Diffusion factors				
Benefits	1.46 (0.29–7.40)	.09 (–.29 to .46)	.02 (–.19 to .23)	–.01 (–.34 to .33)
Advantage	2.26 (0.40–12.81)	–.03 (–.43 to .37)	–.07 (–.29 to .16)	.08 (–.16 to .31)
Public advocacy	4.28* (0.88–20.73)	.35** (.02 to .68)	.11 (–.13 to .35)	.17 (–.04 to .38)
Community characteristics				
Size	3.39 (0.55–20.70)	–.03 (–.41 to .34)	.12 (–.07 to .32)	.11 (–.06 to .27)
Education	1.34 (0.23–7.77)	–.02 (–.39 to .35)	–.10 (–.34 to .14)	–.06 (–.22 to .10)
Income	2.00 (0.17–22.81)	–.15 (–.62 to .33)	.17 (–.058 to .39)	.05 (–.10 to .20)
65+	0.70 (0.16–3.08)	.04 (–.33 to .42)	–.26** (–.51 to .02)	–.11 (–.26 to .03)
Disability	8.79* (0.69–112.14)	.19 (–.33 to .72)	.28** (.03 to .54)	.22** (.05 to .40)
Government characteristics				
Spending	0.28 (0.06–1.28)	–.15 (–.49 to .18)	–.08 (–.267 to .11)	–.12* (–.26 to .01)
Policy entrepreneur	0.85 (0.18–3.91)	.21 (–.12 to .53)	.07 (–.16 to .30)	.15* (–.02 to .32)

Note: OR = odds ratio; CI = confidence interval.

^aLogistic regression.

^bPoisson regression.

* $p < .10$. ** $p < .05$.

with disabilities in this region compared with other parts of the United States: “There are probably not more people here with disabilities, but they are more out in the community.” A third interviewee said, “I think, anecdotally, this area is a magnet for people with disabilities because we have such great services.”

City and Resident Economic Resources.— Interviewees indicated that they viewed some of these innovations as a way to improve the fiscal health of their city. The following quote is from a city with relatively low spending that adopted a high number of innovations: “We see all these policies and provisions coming into place to make downtown more vital, more interesting, and more economically competitive. The thought process is getting more people into downtown.” Similarly, another city planner explained that a recent push by a city to create more walkable mixed-use neighborhoods was motivated in part because “people want more lively places, more lively streets, and they want more of a 24-hr presence.”

In terms of resident economic resources, some cities do not see any need for public supports for their more economically advantaged aging residents. For example, as one city planner explained: “This is an affluent community, so it doesn’t require as much public assistance. I think the seniors do need household assistance and sometimes medical assistance. . . . We are going to promote increased density near the commercial district, and also second units so you can have your nurse living nearby, but most of these services are private in this community.” According to another, “there is a sense that we have addressed a good chunk of part of the need, and I mean by income levels. I tend to focus on below market housing, but there are other niches outside of my scope. There could be a need for empty nester housing but that is not part of our focus.”

Discussion

This mixed-methods study is the first attempt to explore local government adoption of community design, transportation, and housing innovations that could improve elder health, well-being, and the ability to age in place. The quantitative phase tested three hypotheses informed by an internal determinants and diffusion framework using data collected via online surveys with city planners. The qualitative phase used data collected through telephone interviews designed to explain and supplement the quantitative results.

The first hypothesis proposed that three diffusion factors would be positively associated with the adoption of community design, transportation, and housing innovations that could benefit older adults: knowledge of benefits in other jurisdictions, a belief that cities gain an advantage from adopting innovations, and public advocacy. Only public advocacy was significant, and only for community design and transportation innovations. In qualitative interviews, a number of participants reported that resident advocacy influences policy decisions. However, interviews also suggest that public resistance can present a barrier to innovation adoption. Similar to a recent study examining barriers to the adoption of ADU ordinances (Liebig et al., 2006), public resistance came up in discussions about mixed-use and higher-density development, ranging from NIMBY sentiments to residential concerns about parking problems.

The second hypothesis proposed that five community characteristics would be positively associated with innovation adoption: population size, population education, household median income, percentage of the population aged 65 and older, and percent of the adult population with a disability. This hypothesis was partially supported as the percent of the population with a disability was associated with the adoption of community design, housing, and total number of innovations. The percent of the population aged 65 and older was not significant in three of the models and was negatively associated with the adoption of housing innovations. Interview participants mentioned disability advocates more often than older adults or groups representing their interests. Historically, due to their high voter turnout and the organizational power of groups such as AARP, older adults have successfully pushed policymakers at the federal level to adopt policies (e.g., Medicare) targeted to meet their needs (Elder & Cobb, 1984). At the local level, however, interviews suggest that public advocacy for changes to the physical environment comes from residents with disabilities rather than older adults. Previous research has found that advocacy can lead to the adoption of innovations that are particularly salient to residents, such as those around sex education and gambling (Mooney & Lee, 2000), but plays a smaller role in innovations more removed from people’s everyday lives, such as hazardous waste policies (Daley & Garand, 2005). Some of the innovations examined in this study (e.g., incentives to develop accessible housing) address difficulties associated with functional status rather than age. Disability groups may be

more active because individuals who have a disability are more aware of the physical barriers in their communities than older adults who face the possibility of disability in the future. Alternatively, younger individuals with disabilities may be more effective advocates for the adoption of these innovations because the general response to disability varies across age populations. It has been suggested that for younger individuals, disability is more often viewed as a result of problems in the social and physical environment, whereas for older adults disability is more typically attributed to disease (Kane, Priester, & Neumann, 2007). City governments may therefore perceive these innovations as more appropriate for younger adults with disabilities.

The implication is that service providers and advocates should facilitate the involvement of older adults through education and community-building activities. This has proved a successful strategy by the Elder Friendly Communities Project in Calgary, Canada, which has successfully brought about changes, including infrastructure improvements, by training and supporting older adults to plan and carry out actions to change their community (Austin, Des Camp, Flux, McClelland, & Sieppert, 2005). In addition, aging service providers and advocates may also need education about the ways in which the physical environment can affect older adults. Councils on Aging, for example, could broaden their service and advocacy efforts to address community design, transportation, and housing.

Contrary to the second hypothesis and previous research (Berry & Berry, 1999; Shipan & Volden, 2005), there was no significant association with population education or income in any of the four regression models. As discussed in interviews, city government perceptions of the need for many of these innovations may depend on the residents' private economic resources, and city planners in wealthier communities may assume that older residents are wealthy and do not require public assistance. It is possible that older adults with higher education and incomes are less likely to require the public provision of environmental adaptations because of their reduced risk for physical limitations (Freedman & Martin, 1999), lower rates of impairments, and slower deterioration of physical functioning (Mirowsky & Ross, 2000). Higher levels of education have been linked with improved access to care, higher quality of care, and better health behaviors (Goldman & Smith, 2002), and these elders may be able to delay or avoid disabil-

ity because they can obtain personal care, assistive devices, medical care, healthy foods, and exercise equipment (Schoeni, Freedman, & Martin, 2008). Cities whose residents have a lower socioeconomic status, and are therefore more vulnerable to disease and disability, may be more receptive to advocacy efforts to put these innovations in place.

For the third hypothesis, the positive significant association between the existence of a policy entrepreneur and the total number of innovations indicates that enlisting the support of individuals with a formal role in city government may be an effective strategy to innovation adoption. This is consistent with the proposition of Walker (1973) that "the presence of a single aide on a legislative staff who is enthusiastic about a new program, or the chance reading of an article by a political leader can cause [governments] to adopt new programs more rapidly" (p. 1190). Per capita government spending had an inverse relationship with the total number of innovations. Similar to previous studies (e.g., Boyne & Gould-Williams, 2005), this finding combined with qualitative data suggests that the need for economic revitalization could inspire innovation adoption because it creates a greater need for innovative solutions. For example, because city governments receive much of their revenue from sales taxes, property taxes, and user fees (Warner, 2010), incentives for mixed-use development and the construction of residential buildings that dedicate units for seniors could improve city finances. Another implication of this research is that advocates and residents pushing for these innovations should emphasize the potential economic benefits associated with some of these changes.

Findings from the current study should be interpreted in light of its limitations, and future research should examine whether the results are applicable to other cities. First, this study achieved fairly good response rates but may still have some nonresponse error. Second, future research should address the limitation of self-report data by, for example, soliciting participation from multiple employees in each city. Third, because the nonlinear relationship between the continuous variables and outcome variables indicated problems with functional form, the author used median splits, which in turn affects model precision and could lead to overestimation or underestimation of significant statistical relationships (Maxwell & Delaney, 1993). The small sample size also affects the validity of the quantitative results. For example, the logistic

regression model for community design innovations may be overestimating the odds ratios (Nemes, Jonasson, Genell, & Steineck, 2009). Fifth, results may not be generalizable outside of the San Francisco Bay Area because of its unique characteristics, including higher population income and education and rapid population growth at the end of the 20th century (Kawabata & Shen, 2007). Furthermore, the region has a reputation for embracing innovative land use and transportation policies and is often the subject of case studies of these types of innovations (e.g., Bhatia, 2007; Kawabata & Shen).

Additionally, the use of cross-sectional data does not allow for an understanding of the diffusion of innovations over time (Berry & Berry, 1990). Future research should employ techniques such as event history analysis to ascertain which innovations have been in place for years and which have been only recently adopted, uncover if there are particularly influential cities affecting the diffusion process, and further clarify the factors associated with the adoption of these innovations. Other policy researchers (e.g., Downs & Mohr, 1976) have criticized an internal determinants and diffusion framework for the variation in results reported across studies. It is not unusual for factors that are positively associated with one type of policy innovation to be negatively associated, or not associated at all, with other innovations (Downs & Mohr). The researcher selected this framework in part because of its flexibility in the specific characteristics associated with policy adoption, and therefore it is not surprising that results differed from previous research on, for example, local anti-smoking policies (see Shipan & Volden, 2005).

The findings and limitations of this study suggest the need for additional research into local government adoption of community design, transportation, and housing innovations that could benefit older adults. Future research should explore modifications to an internal determinants and diffusion framework as it relates to these policies and programs. For example, although per capita government spending has been used as a proxy measure for government resources in earlier research on local government policy adoption (e.g., Shipan & Volden, 2005), other measures (e.g., city revenues) could be used in future studies. Future studies should also explore whether younger individuals with disabilities are more active in advocating for these innovations than older adults. It is possible that this finding reflects the Bay Area, which, as mentioned by inter-

view participants, has a history of supporting disability rights and the independent living movement. It is also possible that older adults are not as engaged in public policy at the local level, and therefore more research is needed to understand how to promote their community involvement. Third, although there is emerging evidence that these innovations can improve elder health, well-being, and ability to age in place, more research is needed to explore the impact of the environment on older adults. Establishing an empirical evidence base for aging in place will ensure that local governments devote their often scarce resources toward effective policies, programs, and infrastructure changes.

Conclusion

This mixed-methods study explored city-level adoption of community design, transportation, and housing innovations that have the potential to improve elder health, well-being, and the ability to age in community. Quantitative and qualitative results indicate that advocacy is an effective strategy to encourage city adoption of innovations that affect the mobility and quality of life of older adults. Successful advocacy efforts should facilitate the involvement of older residents, target key decision makers within government, emphasize potential financial benefits to the city, and focus on cities whose aging residents are particularly vulnerable to disease and disability.

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