

Inactive by Design? Neighborhood Design and Political Participation

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Abstract Critics have long denounced the design of suburban communities for fostering political apathy. We disaggregate the concept of suburban design into four distinct attributes of neighborhoods. We then use tract-level Census data, the Social Capital Community Benchmark Survey, and multilevel models to measure the relationship between these design features and political participation. Certain design aspects common in suburban neighborhoods are powerful predictors of reduced political activity, illustrating a potential link between neighborhood design and politics. Yet low-density environments appear to facilitate some types of participation. Suburban designs vary, and so do their likely impacts on political participation.

Keywords Political participation · Urban design · Neighborhood effects · Suburban sprawl · Social capital

Introduction

In the past half-century, American communities have undergone a revolution in design. In 1940, 15% of Americans lived in suburbs. Today, 50% do (U.S. Census Bureau 2002, p. 33). Within suburban America, dense communities built around identifiable downtowns have given way to decentralized, car-oriented communities

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(Garreau 1991). The average driver now spends 55 minutes in her car daily (Bureau of Transportation Statistics 2006) as Americans live further from downtowns—and from one another.

As new suburban communities have sprung up, so have arguments about the impact of suburban designs on political participation. Many critics denounce the design of suburban communities for encouraging narrow, parochial conceptions of self-interest as well as political disengagement (e.g. Duany et al. 2000; Kunstler 1993; Davis 1990; Jackson 1985; Danielson 1976). Others offer more mixed assessments, pointing out the benefits that small political communities can have (Oliver 2001) while also acknowledging the negative effects of aggregate commuting (Humphries 2001; Putnam 2000). Still others offer positive assessments, often pointing to the central role of consumer demand in shaping the design of U.S. communities (e.g. Bruegmann 2005; O'Toole 2001; Gordon and Richardson 1998). Given the continued growth of suburban and exurban communities (Nasser and Overberg 2005), assessing the impact of local designs on political behavior in a comprehensive way is crucial.

Scholars have begun to address the connection between neighborhood design and political participation, with particular contributions from survey analysis (Humphries 2001; Oliver 2001; Putnam 2000) and historical approaches (e.g. Freund 2007; Self 2003; McGirr 2001; Jackson 1985).¹ Still, numerous improvements remain to be made (Sander 2002), especially in using nationally representative samples to test the generality of past arguments. In past work, suburban designs are defined inconsistently, and a wide range of theories are invoked to link so-called “suburban sprawl” to reduced political participation. Local designs are usually measured at high levels of aggregation such as the municipality, county, or metropolitan statistical area, despite their considerable variation across neighborhoods. Alternative hypotheses, including the ever-present threat of selection bias, have not been effectively dismissed. This manuscript provides comparable tests of several design-related hypotheses, and thus identifies the influential aspects of neighborhood design.

The next section integrates theories of urban design with explanations of political participation. The article then uses common critiques of suburban development to identify four distinct components of local design. It distinguishes the aspects of local design that shape social organization from those that influence individuals' commitment to their locality or their sense of efficacy. In our view, this disaggregation represents a conceptual contribution. The term “suburban sprawl” is an uncomfortable combination of disparate factors, and until we understand how they interrelate, we cannot understand their net effects. The second section introduces the Social Capital Community Benchmark Survey (SCCBS), a clustered survey of 29,724 Americans from 42 different communities.² The SCCBS is uniquely suited to address these questions. It sampled an extraordinary number of Americans, provides geographic information about respondents' census tracts, and questioned respondents about their political participation. As a result, it allows us to

¹ Similar questions have animated a growing literature in public health as well (e.g. Frumkin et al. 2004; Leyden 2003; Saelens et al. 2003; Frumkin 2003; Frank and Engelke 2001).

² The data and questionnaire are available at <http://www.cfsv.org/communitysurvey>.

focus on design at very local levels, and to detect significant variations within a single metropolitan area. Yet the core results also hold for the 2,994 respondents who were sampled randomly from the nation, ensuring that they are not a product of the specific design of the SCCBS.

The subsequent section illustrates the relationship between local design and political participation. The percentage of one's neighbors commuting alone by car is a reliable, negative predictor of a variety of activities, as is living in a more recently built neighborhood. Since the percent driving alone is a close correlate of car-oriented neighborhoods, findings like this one demonstrate that neighborhood design does matter. Other aspects typically associated with suburban designs, including the community's average commuting time, have effects that are typically weak or undetectable. These patterns point us toward mechanisms that emphasize local design's influence on unscripted contact, political recruitment, and local norms about political contention. We do find an upside to the designs characteristic of suburbs as well. Controlling for other spatial characteristics, lower-density neighborhoods increase some types of political participation, especially attendance at public meetings. This reinforces past findings that smaller, less populated communities encourage participation—and that low-density designs have advantages. Suburban designs, we conclude, are not monolithic.

Conceptualizing Neighborhood Design's Influence

Does the structure of the built environment affect political engagement? This section outlines scholars' existing answers and develops hypotheses about the potential impacts of local design. Neighborhood designs are thought to be connected to a range of outcomes, from political activity to mental well-being (e.g. Oliver 2003). But the facet of neighborhood design that matters and the underlying mechanisms vary by study, making it critical to disaggregate the concept and consider its aspects separately. Currently, our conception of suburban design—often subsumed under the heading of “sprawl”—is all-encompassing and hence imprecise (see also Bruegmann 2005). For that reason, we jettison the notion of sprawl, and focus on neighborhood design instead. We define neighborhood design as the physical features of the immediate built environment in which an individual lives. Suburban design is taken to be a pattern of development marked by falling densities, the acceleration of development on the outer fringes of existing metropolitan areas, the separation of residential and commercial space, and heavy dependence on cars. Scholars of sprawl are commonly interested in characteristics of metropolitan areas; here, we focus on the characteristics of neighborhoods. Design features and other neighborhood attributes can vary markedly over short distances (e.g. Grannis 1998), and it is an individual's immediate surroundings that are most likely to influence her day-to-day encounters and experiences.

In the past decade, some scholars have asserted that urban design structures Americans' political participation. Kohn argues that the character of shared space is essential in facilitating politics: “[p]ublic sidewalks and streets are practically the

only remaining sites for unscripted political activity” (2004, p. 4). The underlying mechanisms in this case are *unscripted contact* and *facilitated recruitment*: traditional urban designs are more permissive of unexpected contacts with neighbors, and also make political recruitment easier. This argument echoes those of many other scholars (Barber 2002; Mattson 2002, p. 45; Duany et al. 2000; Lofland 1998; Moe and Wilkie 1997; Oldenburg 1989; Jackson 1985; Jacobs 1961), and has drawn attention from survey researchers (Gainsborough 2001; Humphries 2001; Oliver 2001; Putnam 2000). Putnam (2000) cites long average commutes as an important predictor of reduced civic engagement (see also Rahn et al. 2003; Humphries 2001). In the Sunbelt, Oliver (2001) found less political participation in areas that had been built more recently. Cutting against the indictments of suburban development, however, he also found that smaller cities generated *increased* political participation.

Hypotheses and Explanatory Variables

The term “suburban” clusters several aspects of community design, so in understanding the overall impact of suburbanization, it is critical to state the theoretical mechanisms linking each of its elements with political participation. At the same time, we outline how each component of suburban design is measured. Throughout, we consider suburban designs chiefly as they influence the perceived costs and benefits of political participation, but we also consider the ways in which they might shape social networks, political organizing, or perceptions about the boundaries of one’s community.

Neighborhood Density

Past literature suggests an inverse relationship between density and participation. This could be because those in densely settled communities feel less externally efficacious, since they perceive that their voice is one among many (Oliver 2001). Put differently, dense environments might exacerbate collective action problems. With many neighbors, no individual feels responsible for getting involved in politics. We term this mechanism *perceived efficacy*. Hence we might expect increased density, measured as the logged number of people per square mile, to predict reduced participation. Conversely, by increasing individuals’ social anonymity, high-density environments might also reduce the capacity to enforce *social norms* limiting overt political conflict. This mechanism would influence only the more conflictual types of activity.

Neighborhood Age

The next two variables speak to the concern that the character of public spaces influences civic activity (Kohn 2004; Oldenburg 1989; Jacobs 1961). The first is traditional or community-oriented architecture, proxied by neighborhood age. Urbanists have demonstrated that neighborhoods built beginning in the postwar suburban boom differ from traditional urban neighborhoods featuring narrow

streets, front porches, integrated commercial sites, and street activity (Flint 2006; Nozzi 2003). Moreover, suburbanization involves the construction of new neighborhoods in undeveloped areas. Newer neighborhoods thus tend to be located on the outskirts of metropolitan areas.

We hypothesize that residence in an older neighborhood increases political participation through multiple mechanisms. First, the older neighborhood design associated with mixed uses is likely to be more conducive to political recruitment than newer, single-use neighborhoods organized around detached houses. These are the *unscripted contact* and *facilitated recruitment* mechanisms at work. As in the work of Huckfeldt and Sprague (1995, p. 17), these mechanisms emphasize that one's exposure to political information is frequently inadvertent, and that it hinges in part on local networks, encounters, and discussions. These mechanisms are likely to operate chiefly on forms of participation like petition-signing, where such contact is essential. Second, older neighborhoods might also contain accumulated *social networks* and organizations which facilitate civic and political activity (Huckfeldt and Sprague 1995; Leyden 2003; but see Mutz 2002), whereas recently built neighborhoods must construct these networks from scratch (McGirr 2001). We expect this second mechanism to influence a broad range of political activities, but with a particular impact on public meeting attendance and other activities that involve acquiring information through local networks.

This is not the first study to use neighborhood age to proxy neighborhood design (see Jargowsky 2002). The validity of neighborhood age as a measure of design is reinforced by examining the correlations between neighborhood age and the suburban sprawl indices developed by Ewing et al. (2002, 2006). At the county level, older housing stock is correlated with Ewing et al.'s index of sprawl (in which higher scores indicate lower sprawl) at $r = 0.58$, weighting by county population.³

Car-Oriented Development

The degree to which a community relies on solo automobile transit is closely related to its design and layout. Urban planners frequently contrast “human-scaled” areas marked by pedestrian activity, bicycles, and accessible public transit with developments designed to accommodate car traffic efficiently. In the latter areas informal street life is less common. It seems plausible that the former type of urban environment encourages political activity—and in fact, recent work has found that those in more walkable, mixed-use communities were more likely to know their neighbors (Leyden 2003). Here, the operative mechanisms include unscripted contact and facilitated recruitment.

We measure whether an area is pedestrian-oriented or car-oriented by using the percentage of residents in the census tract who drive alone to work. We used Google Earth to visualize both the neighborhood age and driving alone measures—and saw

³ Ewing et al. compiled an index of sprawl for metropolitan areas based on four components: residential density, the integration of homes, jobs, and services; the strength of centers, such as business districts; and accessibility via the street network. Subsequently Ewing et al. compiled a sprawl index for 951 metropolitan counties based on two of these factors: density and street accessibility. Our thanks to Reid Ewing for providing us with the index of county-level sprawl scores.

considerably more cul-de-sacs and fewer traditional street grids in newer, more automobile-oriented neighborhoods. More systematically, the Pearson's correlation between the tract's percent driving alone and a three-category measure of the whether a satellite image of the tract had a "traditional street grid" was $-.85$.⁴ Second, we checked the Pearson's correlation between the percentage driving alone at the county level and Ewing's overall index of sprawl. For 951 metropolitan counties for which the index is available, the correlation (weighting by county population) was $r = -0.92$. We can thus be confident in the percent driving alone as a measure of neighborhood design.

Time in Transit

Numerous studies report a link between community-wide average commuting time and reduced civic engagement (e.g. Rahn et al. 2003; Humphries 2001; Putnam 2000). Here, the likely mechanism is the collective loss of time available for political participation, and the *increased coordination problems* that follow. Time in transit is lost to political participation, and those working farther from home are less likely to return for daytime political activities. This variable is measured by the average commuting time among workers in a given census tract. Although time in transit is not itself a neighborhood design feature, it is indicative of land-use patterns in the broader area as well as the neighborhood's relationship to centers of economic activity. Here again, we expect stronger impacts on more time-intensive forms of participation: commuting should matter more for attempts to organize local citizens than for voting or petition-signing.

The four Census variables that measure neighborhood design are summarized in Table 1, and Table 5 in the Appendix presents their correlations. The bivariate correlations illustrate that many of the elements of local design and land use are not highly correlated. The average commuting time, for instance, is not strongly associated with other stereotypically suburban design features, and is negatively correlated with greater solo commuting at -0.22 . This provides strong support for empirically testing the impact of each element separately. The percentage of people driving alone to work is most closely correlated with the other measures of suburban design, making it the measure that seems to track suburban design overall.

Supply-Side Explanations

The mechanisms noted above operate at the individual level. The mechanisms of unscripted contact, perceived efficacy, reduced social networks, changing norms about conflict, and increasing coordination problems all posit design-based changes in the perceived costs and benefits of political activity. But environmental features

⁴ Specifically, we selected 290 census tracts from our survey respondents, over-sampling to represent the surveyed communities as well as the tails of the distribution. Two independent coders then used satellite images of the census tract from Google Earth to identify whether the tract had a traditional street grid, meaning that "the majority of streets visible in the image follow a traditional grid, with frequent intersections and few cul-de-sacs or dead-ends." Coders could respond "yes," "no," or "mixed/ambiguous."

Table 1 Summary of key independent and dependent variables (all independent variables are measured at the census tract level)

	Mean	SD	Min.	Max.
Independent variables				
% Drive alone to work	0.75	0.14	0.00	1.00
Avg. commuting time	23.43	5.68	7.29	65.53
Median year home built	1964.74	15.72	1939.00	1999.00
Population density	5059.49	8764.58	0.30	218000.00
Dependent variables				
Voted, '96	0.70	0.46	0	1
Registered	0.82	0.38	0	1
Public mtg.	0.44	0.49	0	1
Local reform grp.	0.21	0.41	0	1
Political grp.	0.10	0.30	0	1
Signed petition	0.40	0.49	0	1
Attend rally/political mtg.	0.18	0.39	0	1
Attended march/protest	0.08	0.27	0	1

might also influence opportunities for participation, as the *facilitated recruitment* mechanism emphasizes. Meaningful political activity requires a critical mass of interested citizens, and forming such a mass requires that activists be able to recruit others. It is plausible that activists will concentrate their recruitment activities where the perceived costs of undertaking visible political activity are lower. The individual-level mechanisms posited above could easily be compounded by organizers' choices about where to recruit and target and by other self-reinforcing mechanisms. Public spaces with high pedestrian traffic might be especially good places for political organizers. Some forms of political participation are more susceptible to contagion or recruitment than others (Cho and Rudolph 2008), so we will address these supply-side hypotheses by looking at the differential influence of each design feature on particular types of political activity.

Data and Methods

A methodological challenge in gauging the impact of suburban design is the appropriate scale at which it should be measured. Most efforts to construct indices of suburban design or sprawl have focused on the metropolitan area (e.g. Cutsinger et al. 2005; Ewing 2002). Other studies have utilized the county or the municipality as the unit of analysis (e.g. Oliver 2001). In our view, there is no single ideal scale at which design should be measured. What is important is that there be a close fit between the scale of analysis, the dependent variables being studied, and the available data. In examining macro-level phenomena such as the fiscal or environmental consequences of suburbanization, larger scales such as the

metropolitan area make good sense. In studying individual-level phenomena, however, such a large scale may obscure the substantial variations in spatial context within a given metropolitan area.⁵ It is critical to add that the core results reported below are robust to this choice of unit: despite counties' vastly larger sizes, we reach the same conclusions when instead using county-level data. While the Modified Areal Unit Problem looms in theory, it does not seem to impact our empirical conclusions below.⁶

This consideration, as well as our theoretical focus on neighborhood-level design, guides us to a much smaller unit of analysis: the census tract. Focusing on census tracts allows us to specify the immediate context of an individual's daily life, and to do so with less measurement error than exists at higher levels of aggregation. Unlike counties or metropolitan areas, the population of census tracts is relatively uniform across the United States, typically ranging between 4,000 and 6,000 residents. Clearly, some of our measures will be heavily influenced by metropolitan-level characteristics. The local commuting time is shaped by the distance to places of employment. But since the theories above conceptualize the built environment primary as a local influence on the costs and benefits of political participation, it is appropriate to measure the environment at the lowest available level of aggregation, one that approximates the built environment immediately surrounding the individual's residence. Our analysis proceeds by matching census tract data from the 2000 U.S. Census to the SCCBS, which was itself conducted in the summer and fall of 2000. 29,133 of the original 29,724 cases were successfully matched in this fashion, with the missing cases distributed evenly among the community and national samples.⁷ The SCCBS covers all parts of the country, from the rural Kanawha Valley to San Francisco.

Following previous analyses of the SCCBS (e.g. Rudolph and Popp 2010), we use multi-level logistic regression models (Gelman and Hill 2006; Steenbergen and Jones 2002) to account for the fact that our respondents are clustered into specific geographic communities. Multilevel models with random effects at the level of the sampled community will appropriately adjust our standard errors in light of any place-based correlations in political behavior. From linear multilevel models with no covariates, we learn that the political behaviors studied below do not show heavy clustering at the level of the surveyed community: the share of the variance in the dependent variables that is explained at the community level varies from a low of 0.002 (joining a political group) to a high of 0.07 (participating in a rally or political meeting).⁸ There is little

⁵ To determine if there was much to be gained from a tract-level analysis, for each of our key independent variables, we calculated the proportion of the variance that was attributable to differences across metropolitan areas. The proportions ranged from 0.15 (for density) to 0.35 (for commuting time), indicating that in all cases, the majority of the variation is *within* rather than across metropolitan areas.

⁶ In part, the reason for this is that contextual measures of design across different levels of aggregation show surprising correlations. For example, the logged density of SCCBS national respondents' census tracts correlates with the logged density of their counties at 0.74.

⁷ 9,215 of these respondents did not have available census tract information, and they were assigned to a census tract based on the geographic center of their ZIP code.

⁸ For other measures, the figures are 0.004 (attendance at public meetings), 0.04 (voting), 0.004 (registering to vote), 0.003 (joining local reform group), 0.010 (participating in a march or demonstration), and 0.03 (signing a petition).

benefit to clustering observations at lower geographic levels, since the 2000 SCCBS includes respondents from 6,119 unique ZIP codes and more than 9,000 unique census tracts.

The SCCBS was the product of deliberate sampling based on local funders, raising the possibility of selection bias. Self-reported voter turnout in the selected communities was 71%, as compared to 66% in the subset of the data that is nationally representative. It is plausible that communities interested in supporting the survey were systematically more participatory. One point to emphasize is that the multilevel model fits community-specific random effects, meaning that the model is leveraging variation in neighborhood design *within* a given surveyed area. Also, the surveyed communities remain quite diverse in terms of their income, location, and politics: they include the Kanawha Valley in West Virginia, the City of San Francisco, and many places between them. Even without the national sample, the data set is 9% Hispanic and 11% Black, and it has a mean tract-level income of \$46,680. In the aggregated community samples, the mean tract-level percent with a Bachelor's degree is 18%. All of these estimates are close to corresponding figures from the national sample.

Still, as a robustness check, all analyses were replicated with a nationally representative subsample of 2,994 respondents that had no geographic clustering. Doing so indicates that the results generalize to the nation as a whole, and that they are not a product of the specific communities surveyed or the clustered design. Certainly, if we were interested in estimating tract-specific parameters, such as the levels of participation in a given neighborhood, this national sampling frame would be prohibitive. Within the national sample, no census tract provides more than four respondents. But because we aim to recover the relationship between observed characteristics of *individuals'* neighborhoods and their political participation, using a national sample poses no particular problems. Indeed, several past analyses have made contextual claims using nationally representative surveys with little or no geographic clustering (see Humphries 2001; Oliver 2001; Branton and Jones 2005).

Measures of Political Participation

The SCCBS covers a wide range of political and non-political behaviors. In this article, we focus narrowly on the relationship between design-related variables and political activity; future work should consider civic organizations, informal socializing, and other related metrics. The SCCBS provides information about eight explicitly political activities: voting, registering to vote, attending public meetings, joining a local reform organization, joining a political organization, petition signing, attending a political meeting or rally, and participating in a march or protest.⁹ These measures are summarized in Table 1.¹⁰

⁹ Voting measures whether the respondent reported voting in the 1996 presidential election, while the other activities are measured according to whether the respondent had engaged in the activity within the previous year.

¹⁰ The question wording for key variables is available in the [Appendix](http://www.cfsv.org/communitysurvey/docs/survey_instrument.pdf). For other variables, please see http://www.cfsv.org/communitysurvey/docs/survey_instrument.pdf.

Following canonical participation research (e.g. Verba et al. 1995, Chap. 12), we expect that different types of participation will have different antecedents, and so our analyses consider these activities separately. The political activities studied here do not capture the full range of political participation, of course, but they do capture several key dimensions. For example, voting and registering to vote are election-related, and are subject to mobilization by political organizations. Other activities, such as membership in a local group, stand out as being more time-intensive. Still others are shaped largely by supply-side considerations: respondents cannot sign petitions if there is no one asking them to do so. The activities also establish different relationships between citizens and public officials, from more formal, cooperative channels (such as petitioning) to more adversarial activities (such as attendance at a march). Finally, while one can register to vote and vote alone, other activities are more dependent on the participation choices of others. There are not many one-person demonstrations or meetings.

Other Independent Variables

Local design features are correlated with several potentially confounding variables, both at the tract and at the individual level. The value of multivariate analyses is precisely that they can partition the variance in an outcome among a variety of potential variables, telling us whether suburban environments differ because of contextual effects or because of differences in the individuals within them. Hence our models include a number of additional contextual variables, some of which have been linked to suburban design indirectly. These measures include the tract-level median household income; tract-level income inequality, measured by the Gini coefficient; the tract's ethnic and racial composition, measured via the Herfindahl index¹¹; its level of educational attainment, measured by the percentage of census tract residents with Bachelor's degrees; the level of residential turnover in the preceding five years; and the neighborhood's presence in a central city. We also control for a standard battery of individual-level characteristics, including age, gender, race, educational attainment, income, homeownership, years lived in the community, citizenship status, personal commuting time in hours, and the language in which the interview was conducted. In various robustness checks, we add attitudinal measures to the individual-level independent variables, including the respondent's political ideology and her interest in politics. Table 2 summarizes these independent variables. Certainly, community design could influence political participation indirectly through its influence on economic segregation (e.g. Yang

¹¹ Although originally designed to measure industrial concentration, the Herfindahl index can measure the diversity of any population sorted into a finite number of mutually exclusive and exhaustive groups. Mathematically, it indicates the probability that two chosen units will be from the same group. Within studies of racial and ethnic politics, it is commonly employed to measure ethnic and racial diversity (e.g. Alesina et al. 1999; Branton and Jones 2005). To calculate a Herfindahl index, one sums the squared proportion of each group within a population. We do so using four census-defined groups: non-Hispanic whites, non-Hispanic blacks, non-Hispanic Asians, and Hispanics. The Herfindahl index can be interpreted as the probability that two members of a community are of the same racial or ethnic group.

Table 2 Summary of explanatory variables

	Variable	Mean	SD	Min.	Max.
<i>Tract level</i>					
	% with BA	0.18	0.11	0.00	1.00
	Gini coef. for income	0.40	0.05	0.14	0.64
	% Same town, 95-00	0.67	0.13	0.00	0.98
	Herfindahl	0.72	0.21	0.22	1.00
	Household median income	46.35	19.93	0.00	200.00 ^a
	Center city	0.38	0.48	0.00	1.00
<i>County level</i>					
	% Dem Pres 00	0.49	0.12	0.08	0.82
<i>Individual level</i>					
	Commute	0.27	0.40	0.00	4.92
	Male	1.41	0.49	1.00	2.00
	Asian American	0.02	0.15	0.00	1.00
	Hispanic	0.09	0.29	0.00	1.00
	Black	0.13	0.33	0.00	1.00
	U.S. Citizen	1.95	0.22	1.00	2.00
	Survey in English	1.96	0.19	1.00	2.00
	Tenure in community	3.57	1.48	1.00	6.00
	Education	3.68	1.83	1.00	7.00
Tenure in the community and education are categorical variables with six and seven response options, respectively. Higher values of ideology are more conservative	Age	44.69	16.67	18.00	99.00
	Income	53.97	34.56	10.00	125.00 ^a
	Homeowner	0.69	0.46	0.00	1.00
<i>Attitudinal</i>					
	Ideology	3.17	1.14	1	5
	Interest in politics	2.92	0.97	1	4

^a Denotes that this variable is in thousands

and Jargowsky 2006) or racial homogeneity (Oliver 2001) as well. Yet we consider only direct effects here, yielding potentially conservative estimates.

Results: Design's Multiple Impacts

This section employs multi-level logistic regressions to examine the relationship between design-related variables and political participation. These models are sometimes known as “random intercept” models, as they assume that each cluster has a random effect which is drawn from a normal distribution. Initially, we model three binary dependent variables which represent a range of political activities: whether the respondent voted in 1996, whether the respondent attended a rally or political meeting in the last year, and whether the respondent attended a public meeting in the last year. Table 3 shows that the impact of our key variables hinges on the dependent variable. The percentage of the respondent's neighbors who drive alone to work is a negative predictor of all three, although only its relationship to rallies and public meetings proves statistically significant. The median year in which the communities' homes

Table 3 Multi-level logistic regressions of three key dependent variables

Variable	Voted '96		Attended rally		Attended public mtg.	
	β	SE	β	SE	β	SE
Intercept	-9.474	3.356	7.209	3.310	7.276	2.492
% Drive alone	-0.322	0.203	-0.722*	0.197	-0.467*	0.152
Avg. commute	0.003	0.004	0.002	0.004	0.001	0.003
Median year built	2.173	16.835	-50.916*	16.651	-32.229*	12.565
Lg. density	-0.011	0.013	-0.022	0.014	-0.092*	0.010
Tr. gini	-0.811	0.433	1.132	0.423	-0.073	0.331
Tr. homogeneity	0.028	0.114	-0.137	0.117	-0.017	0.087
Tr. hsh. med. Inc.	-0.049	0.018	0.011	0.015	-0.007	0.012
Tr. % BA	1.724	0.314	0.295	0.295	0.237	0.232
Tr. % Sm town 95	0.565	0.190	-0.114	0.189	0.162	0.147
Center city	0.023	0.052	0.073	0.051	-0.074	0.040
English interview	0.617	0.124	0.271	0.135	0.181	0.092
Male	-0.094	0.034	0.218	0.034	-0.143	0.027
Tenure	0.069	0.012	0.072	0.013	0.076	0.010
U.S. citizen	4.424	0.196	0.840	0.122	0.250	0.077
Education	0.442	0.013	0.210	0.010	0.203	0.008
Income	0.061	0.006	0.052	0.006	0.063	0.005
Age	0.059	0.001	0.000	0.001	-0.011	0.001
Black	0.257	0.055	0.316	0.055	0.448	0.044
Hispanic	-0.284	0.069	0.246	0.076	0.167	0.059
Asian	-1.447	0.120	-0.118	0.122	-0.365	0.093
Commute	0.132	0.044	-0.004	0.043	-0.003	0.034
Homeowner	0.360	0.041	0.148	0.045	0.417	0.034
Total observations	25,599		25,691		25,691	
Communities observed	42		42		42	
Random eff. var.	0.021		0.051		0.004	

The above table presents multi-level logistic regressions of three key dependent variables on the basic model, with the star (*) denoting significance for key variables at the $p < 0.05$ level. The impact of the various measures of design hinges on the dependent variable

were built correlates negatively with attendance at rallies and public meetings—but again, not voting. Average commuting time, conditional on these other covariates, is not a strong predictor of these behaviors. On the other hand, population density has a significant negative effect on attending public meetings.

From this initial analysis, the negative impacts of design show up clearly in a community's age and its percentage of residents driving alone to work. At the same time, population density has cross-cutting effects for public meeting attendance. Figure 1 illustrates these results for attendance at political meetings and rallies.

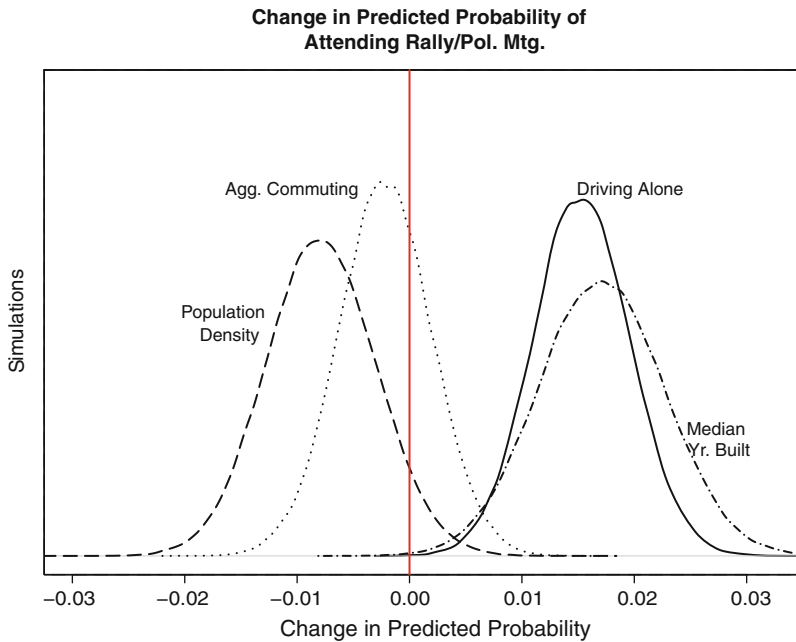


Fig. 1 This figure compares the impact of various aspects of suburban design on a key dependent variable, the probability of attending a rally or political meeting. It shows the predicted probabilities when we shift each of our four measures from the 20th to the 80th percentile away from “suburban” design. Two variables are positively related to rally attendance: residents in a community with relatively few neighbors driving alone to work or in an older community show higher probabilities of attending rallies or political meetings. Density has the opposite relationship

Design features typical of suburbs seem to have their most marked negative impact on more intensive or conflictual political activities.¹²

We now estimate our basic model for all eight dependent variables, as shown in Table 4. With the potential exceptions of voting-related activity and petition-signing, the percentage of residents driving alone to work is a consistently negative predictor of political behavior. Similarly, recently constructed communities reduce more intensive and conflictual kinds of participation, but have no strong impact on registering to vote or voting.¹³ This differential impact on conflictual forms of participation gives weight to social norms about legitimate behavior as a likely

¹² A similar pattern of results also appears when we remove the 4,055 respondents who live outside metropolitan areas, affirming that these results are not driven by rural respondents. Still, our purpose is to capture the influence of spatial features, and to remove rural residents from our standard models would limit both the available variation and the generality of our findings.

¹³ Given that we measure design in part through the age of the median home, we also explored whether there were non-linear effects that might be evidence that certain time periods had especially influential designs. To do so, we broke up the age-based measure into five categories, and explored the impact of the resulting indicator variables. Our results showed a continual decline as homes grow younger, and did not give strong evidence of non-linear effects. However, with the rise of “New Urbanism” and related design principles, scholars could productively retest this possibility with data from more recent years.

Table 4 Partial results from eight multi-level logistic regressions (using the same model as in Table 3)

Dependent variable	Driving alone			Avg. commute time		
	β	SE	Z	β	SE	Z
Voted 96	−0.322	0.203	−1.585	0.003	0.004	0.813
Reg. to vote	−0.427	0.242	−1.763	−0.000	0.005	−0.059
Reform grp.	−0.621	0.184	−3.378	−0.002	0.004	−0.581
Member of pol. grp.	−0.886	0.221	−4.012	−0.003	0.005	−0.610
Signed petition	−0.300	0.176	−1.705	0.007	0.003	2.062
Attend march	−1.118	0.256	−4.369	0.003	0.006	0.565
Attend rally	−0.722	0.197	−3.658	0.002	0.004	0.522
Attend public mtg.	−0.467	0.152	−3.080	0.001	0.003	0.212
Dependent variable	Median year homes built			Lg. pop. density		
	β	SE	Z	β	SE	Z
Voted 96	2.173	16.835	0.129	−0.011	0.013	−0.853
Reg. to vote	−11.262	19.972	−0.564	−0.032	0.016	−2.017
Reform grp.	−43.432	15.497	−2.803	−0.012	0.013	−0.934
Member of pol. grp.	−62.200	19.323	−3.219	−0.035	0.016	−2.159
Signed petition	−39.201	14.236	−2.754	0.005	0.012	0.425
Attend march	−73.377	22.742	−3.226	0.026	0.021	1.248
Attend rally	−50.916	16.651	−3.058	−0.022	0.014	−1.591
Attend public mtg.	−32.229	12.565	−2.565	−0.092	0.010	−9.082

The percentage of tract residents who drive alone to work is a consistently negative predictor of political activity. Also, as neighborhoods get younger, they dampen participation in the less common and conventional forms of political participation. Z scores greater than 1.96 are significant at the $p < 0.05$ level

mechanism. At the same time, the null effects for voting suggest that the mechanism of declining perceived political efficacy is less likely to be at work.

Intriguingly, we do not find aggregate commuting time to be a powerful predictor of political behavior, petition-signing being the lone exception.¹⁴ This suggests that the operative mechanism is not increased coordination problems stemming from long commutes. But this makes sense: because it reduces the net time available for participation, aggregate commuting time should matter more for repetitive activities like Parent-Teacher Associations or book clubs than for acts of sporadic political participation.

Public meetings continue to be an atypical dependent variable, in that they are negatively related to population density. One potential explanation is that public meetings are dominated by school-related events, although conditioning on whether the respondent is a member of a Parent-Teacher Association does not change the estimated influences of design. We see a similarly negative relationship between population density and being a member of a political group or registering to vote.

¹⁴ Here, the negative correlation is surprising until one considers that mass transit use correlates positively with average commuting times.

According to these data, it is low-density communities where these types of political activities are more common.

One challenge is that these results could be specific to the level of aggregation used, the census tract. While the census tract is clearly preferable to the county given the former's close connection to respondents' residential community, we duplicated our key findings at the county level. They remain quite similar. The age of the community's buildings and especially the percent driving alone are negative predictors of non-electoral activities; aggregate commuting time is generally a weak predictor; and population density is a negative predictor of public meeting attendance and reporting membership in a political group.¹⁵

Selection Bias and Alternative Explanations

This finding of a conditional correlation between specific design-related variables and reduced levels of political activism lends itself to several explanations. The first is advanced by Kohn and many urban designers: different spatial contexts vary in the extent to which they facilitate political communication and political organizing. For instance, urban environments provide more public spaces and more opportunities for unscripted social interaction, which may in turn influence activism. But in studies of contextual effects, selection bias is an ever-present issue, and represents one of the central challenges to valid inference (Handy et al. 2006; Sampson et al. 2002). To be causal estimates, the models above need to assume that the characteristics of an individual's census tract are randomly assigned, and are not the products of moving decisions. That assumption is patently false. It is quite plausible that people have underlying propensities that influence both where they live and how they participate. For example, one might have a predisposition to social or public life that influences both what neighborhoods and what activities are appealing. There is no easy solution, but here, we try to confront selection bias by using available information to test the possibility that selection processes are driving these results.

First, the results hold up at higher levels of aggregation such as the county, even though selection processes across counties are likely to be less pronounced. Also, we consider the alternative explanation that individuals choose environments in part because of their political characteristics. Perhaps liberal activists systematically group themselves into cities whereas conservatives and moderates prefer suburbs (Gainsborough 2001). Strikingly, the link between design-related characteristics and reduced participation remains robust even after we control for individuals' political ideology, their interest in politics, and their county's political partisanship. In Table 6 in the [Appendix](#), we show that the basic pattern of results remains even conditioning on these three measures. For behaviors such as participating in local reform efforts, conditioning on political factors seems to enhance the negative effects of high-density neighborhoods. It is not just that people in car-dependent neighborhoods have different political preferences, or less concern with politics.

¹⁵ The pattern of results also holds when using standard logistic regression with clustered standard errors, indicating that it is robust to modeling decisions.

A second strategy for confronting selection bias is to identify who within the data set should be more or less susceptible to it. First, we confirmed that the same findings hold when we restrict the sample to the 12,612 respondents who reported a household income of \$30,000 or lower. These individuals are likely to be more constrained in their housing choices, and less able to match their place to their preferences. We then investigated other subsets where selection bias is less pronounced. To the extent that selection bias is operating, it is likely to be a stronger factor in explaining participation among those who have recently moved. There are two reasons for this. First, people who have recently moved have not been susceptible to the influence of their new environment for long, weakening any potential contextual treatment effects. If context is correlated with participation among new residents, such correlations would have to be the result of selection processes. Also, such residents recently had the opportunity to match their context with their preferences, reducing the mismatch. To be clear, we are not assuming that those who have lived in their communities for a long time are representative of the population as a whole. Instead, given the significant costs and friction in moving, we assume that they are somewhat less likely to be living in a community based on their personal values, their propensity to participate, or their orientation toward social life. If we restrict the data set to the 13,018 respondents who have lived in the same community for more than ten years, we can re-estimate the basic models from above and see if the results prove robust. They do, at least in part. Yet again, the percentage of people within the census tract driving alone to work is a strong negative predictor of several dependent variables (see Table 7 in the [Appendix](#)), including joining a reform effort or participating in a march. Younger communities continue to discourage attendance at marches and demonstrations. And low-density communities have more public meeting attendees.¹⁶

Another alternative explanation is reverse causation. Perhaps cities with activist populations become less likely to evolve in suburban directions, and more likely to embrace public transit and other density-increasing policies. Looking retrospectively, it is not clear that those places which have urban designs now were better mobilized in the past. First of all, if community mobilization did have an impact on local design in the period leading up to 2000, it as likely would have taken the direction of promoting more lower density and more car-oriented development (e.g. Lassiter 2006; Kruse 2005; Self 2003; Burns 1994). Second, the number of instances in which popular mobilization has shaped urban design is quite small (e.g. Gans 1967). Likewise, public transportation systems have generally been implemented in a top-down fashion in which high-level officials establish the basic parameters of policy; citizen participation on transportation-related issues tends to be defensive and highly localized (Altshuler 1979; Schrag 2006). Third, exogenous geographic factors account, sometimes decisively, for many of the nation's dense metropolitan areas. Cities like

¹⁶ To address the possibility that the results are driven by people's underlying propensity toward social and public life, we estimated the same model using an index of social trust as our dependent variable. Living in a neighborhood with more solo commuters correlates with *higher* social trust, leading us to believe that the core results do not reflect differences in respondents' psychological orientations toward social life.

Boston and San Francisco, which are hemmed in by water, mountains, or other geographic features, are far less likely to develop in low-density, car-oriented patterns.

Yet another alternative explanation is that design shapes political participation only by shifting its outward forms. Perhaps residents of low-density, car-dependent neighborhoods substitute away from meetings and rallies and toward online activism, for example. A detailed treatment of internet-based political participation is beyond our scope here (see instead Wellman 1999; Behrens et al. 2007; Hindman 2009). However, we should note that in our data, we find little evidence that newer neighborhoods, car-dependent neighborhoods, or neighborhoods with high aggregate commuting correlate with increased use of the internet. Using our basic model above, we find no strong evidence that these design measures are related to higher or lower total internet time. The same is true for participation in an online discussion. At the same time, we do observe that respondents in more dense communities report higher levels of both activities. At least as of 2000, newer, car-oriented designs were not merely channeling political participation online.

Conclusion: The Influence of Urban Design

Urban designers and other case study-based researchers often conclude that there is “a direct causal relationship between the character of the physical environment and the social health of families and the community at large” (Duany, p. xiii). Claims about causation in observational settings are difficult to prove, relying as they do on strong assumptions about omitted variables. Still, the conditional correlations presented here partially reinforce that claim, and are robust to a variety of possible explanations. Substantively, they are substantial as well. As we move from a community where 66% of people commute alone to a community where 85% do—that is, as we move from the 20th percentile to the 80th—we should expect the probability of attending a rally or political meeting to drop by 1.5 percentage points, or 8%.¹⁷ Less common and more conflictual activities are especially susceptible to environmental influence. While this impact is not as strong as a comparable shift in education (which produces a 41% increase), the effect is identical to that comparing homeowners and renters (8% increase). Intriguingly, the activities that are most consistently influenced by design are the activities that rely most on social contagion effects. Few people attend rallies or meetings if they expect not to know anyone there. Thus the pattern of results reinforces the claim that local designs shape politics through their influence on recruitment and on local norms.

One aspect common to suburban designs runs against this trend: population density. Moving from the 20th percentile to the 80th in terms of density—that is, moving to a more dense, more “urban” environment—we should expect a 0.8 percentage point decline in the probability of attending a rally¹⁸ and a marked 7.2

¹⁷ The 95% confidence interval runs from 0.6 percentage points to 2.4 percentage points.

¹⁸ Here, the 95% confidence interval runs from −0.2 to 1.7 percentage points.

percentage point drop in the probability of attending a public meeting.¹⁹ Less dense environments do facilitate certain political activities, sometimes powerfully. Suburban neighborhood designs are not monolithic, and their effects are not always in the same direction. Still, these impacts are two of the only examples of suburban design's positive potential across the four independent variables and eight dependent variables examined here.

Past work has suggested many reasons why neighborhood designs common in suburbs might influence political participation, but we now have evidence on which aspects of local design influence which political behaviors. Communities dominated by newly built homes and by cars are less successful as incubators for political participation. Future work could productively measure local organizational life to further explore the extent to which these findings are driven by supply-side factors and by differences in recruitment: people do not attend meetings that are not held. By contrast, explanations based on considerations about time lost to commuting and the associated coordination problems seem less compelling in light of these results.

Traditional urbanist communities oriented around transit, walking, and biking, as well as communities built before 1950, appear to be more hospitable locales for political participation, even accounting for a host of confounding factors. The conventional wisdom of New Urbanists and planning scholars which assumes a strong connection between spatial design and behavior appears correct: design does matter. From a civic point of view, the one upside to the kinds of suburban communities which America has built in the last third of the twentieth century is their comparatively low density. Empirically, one valuable next step is to consider who is most influenced by the design factors we have emphasized here.

Normatively, the finding that some elements of suburban design are detrimental to non-electoral participation must be weighed against both the benefits suburbanization brings and the cost of shifting to a different urban development pattern. Answers to such questions await future research and additional empirical work—as well as spirited public debate over the costs and benefits of suburban designs. This article emphatically does not establish that all dimensions of suburban design are harmful to the goods democratic citizens should care about. It does show, using the best data currently available, that some important aspects of those designs have a robust negative relationship with citizens' participation.

Appendix

Question Wording

This section provides the question wording for the dependent variables—all of which are indicator variables—and select independent variables.

Respondents to the SCCBS were asked: “Which of the following have you done in the past twelve months?”

¹⁹ The 95% confidence interval for the impact of density on public meetings runs from 5.6 to 8.7 percentage points.

- “signed a petition?”
- “attended a political meeting or rally?”
- “participated in any demonstrations, protests, boycotts, or marches?”

Other questions used as measures of participation are:

- “Are you currently registered to vote?”
- “As you may know, around half the public does not vote in presidential elections. How about you—did you vote in the Presidential election in 1996 when Bill Clinton ran against Bob Dole and Ross Perot, or did you skip that one?”
- “Just answer ‘yes’ if you have been involved in the past 12 months with this kind of group... Other public interest groups, political action groups, political clubs, or party committees”
- “How many times in the past twelve months have you attended any public meeting in which there was a discussion of town or school affairs?” (Coded as 1 for people who attended any meetings, 0 otherwise)
- “Did any of the groups that you are involved with take any local action for political or social reform in the last 12 months?”

Table 5 Pearson’s correlations for key independent variables

	Avg. commute	Median year home built	Log pop. density
% Drive alone to work	−0.22	0.49	−0.40
Avg. commuting time	1.00	0.11	0.08
Median year home built		1.00	−0.38
Lg. population density			1.00

Key independent variables are often not highly correlated, indicating that suburban design is indeed a multidimensional concept

Table 6 Multi-level logistic regression models including political independent variables

Dependent variable	Drive alone			Avg. commute time		
	β	SE	Z	β	SE	Z
Voted 96	−0.279	0.215	−1.300	0.002	0.004	0.528
Reg. to vote	−0.309	0.257	−1.205	0.001	0.005	0.209
Reform grp.	−0.526	0.184	−2.863	−0.005	0.004	−1.262
Member of pol. grp.	−0.644	0.236	−2.730	−0.004	0.005	−0.824
Signed petition	−0.200	0.182	−1.101	0.007	0.004	1.858
Attend march	−0.835	0.265	−3.154	0.001	0.006	0.138
Attend rally	−0.554	0.208	−2.661	0.001	0.004	0.218
Attend public mtg.	−0.289	0.166	−1.740	0.002	0.003	0.591

Table 6 continued

Dependent variable	Median yr. homes built			Lg. pop. density		
	β	SE	Z	β	SE	Z
Voted 96	7.728	17.897	0.432	−0.015	0.014	−1.019
Reg. to vote	−17.446	21.312	−0.819	−0.037	0.017	−2.172
Reform grp.	−36.065	15.786	−2.285	−0.031	0.013	−2.304
Member of pol. grp.	−51.059	20.791	−2.456	−0.038	0.017	−2.193
Signed petition	−33.201	14.730	−2.254	0.002	0.012	0.159
Attend march	−58.878	23.486	−2.507	0.006	0.022	0.277
Attend rally	−45.801	17.627	−2.598	−0.029	0.015	−1.970
Attend public mtg.	−26.475	13.736	−1.927	−0.081	0.011	−7.211

This table modified the multi-level logistic regression model from Table 3 to include several potentially confounding political variables, including measures of respondents' political ideology, their interest in politics, and their county's two-party support for Al Gore in the 2000 election. The conclusions from Table 4 remain largely unchanged, meaning that the results are not due to differences in political attitudes across neighborhood contexts

Table 7 Multi-level logistic regression models estimated for long-time residents

Dependent variable	Drive alone			Avg. commute time		
	β	SE	Z	β	SE	Z
Voted 96	−0.347	0.341	−1.017	0.006	0.006	0.908
Reg. to vote	−1.157	0.425	−2.719	−0.003	0.007	−0.342
Reform grp.	−0.667	0.271	−2.465	−0.006	0.005	−1.039
Member of pol. grp.	−1.074	0.328	−3.276	−0.002	0.007	−0.317
Signed petition	−0.484	0.261	−1.855	0.007	0.005	1.400
Attend march	−1.115	0.369	−3.021	0.006	0.008	0.784
Attend rally	−0.290	0.297	−0.974	0.008	0.006	1.435
Attend public mtg.	−0.404	0.234	−1.727	−0.001	0.004	−0.178
Dependent variable	Median yr. homes built			Lg. pop. density		
	β	SE	Z	β	SE	Z
Voted 96	4.673	27.104	0.172	−0.030	0.020	−1.495
Reg. to vote	−5.785	33.123	−0.175	−0.034	0.024	−1.377
Reform grp.	−38.573	22.395	−1.722	−0.026	0.018	−1.483
Member of pol. grp.	−47.148	28.314	−1.665	−0.038	0.022	−1.738
Signed petition	−9.399	20.476	−0.459	0.000	0.016	0.012
Attend march	−67.121	32.822	−2.045	0.003	0.027	0.126
Attend rally	−22.744	24.379	−0.933	−0.020	0.019	−1.055
Attend public mtg.	−35.436	18.840	−1.881	−0.096	0.014	−6.701

To confront the challenge of selection bias, we re-estimated the model from Table 3 on the subset of 13,018 respondents who have lived in their present community for over 10 years. These entrenched people have been susceptible to community influence for longer, and may well have jobs, families, friends, or other factors that prevent them from moving. Even among this group, as the number of one's neighbors who drive alone to work rises, participation in a variety of political activities drops

Respondents were also asked questions about their tenure in the community, political interest, and ideology, such as:

- “How many years have you lived in your community? Less than 1 year, 1–5 years, 6–10 years, 11–20 years, more than 20 years, or all your life?” (Coded 1–6)
- “How interested are you in politics and national affairs? Are you very interested, somewhat interested, only slightly interested, or not at all interested?” (Coded 1–4)
- “Thinking politically and socially, how would you describe your own general outlook—as being very conservative, moderately conservative, middle-of-the-road, moderately liberal or very liberal?” (Coded 1–5)

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