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THE SOCIAL CONSEQUENCES OF HOUSING

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ABSTRACT

The social capital literature documents a connection between social connection and economic outcomes of interest ranging from government quality to economic growth. Popular authors suggest that housing and architecture are important determinants of social connection. This paper examines the connection between housing structure and social connection. We find that residents of large apartment buildings are more likely to be socially connected with their neighbors, perhaps because the distance between neighbors is lower in apartment buildings. Apartment residents are less involved in local politics, presumably because they are less connected with the public infrastructure and space that surrounds them. Street crime (robbery, auto theft) is also more common around big apartment buildings and we believe that this also occurs because of there is less connection between people in apartments and the streets that surround them.

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I. Introduction

How does the physical environment effect social interaction? Policy decisions, such as zoning laws and public housing rules, that influence the physical environment of many people are made regularly. Yet, we know very little about the social impact of housing structure. Are taller, larger buildings more social or more anonymous? Do single-family detached homes make better citizens by increasing the connection between residents and the space that surrounds them? Is there more crime in tall buildings? If building structure has an impact on citizenship, crime and social connection then there are externalities associated with housing design. Housing policy should be made with these externalities in mind. Indeed, popular beliefs about these questions already influence policy. The goal of this paper is to bring some statistical light to bear on these popular beliefs.

The paper attempts to provide answers to three questions about housing structure. First, is there a connection between housing structure and citizenship? One possible reason for this connection is that individuals in single-family homes are directly connected with the area that surrounds them; individuals in large apartment buildings are separated physically from public infrastructure. Furthermore, the division of labor within a building rises with the size of the building. In larger buildings, there are professionals who handle the interaction with the outside community. In single-family detached homes, every owner is his own community-relations specialist and sewage expert.

Indeed there is a connection between living in multi-unit dwelling and involvement in local politics and solving local problems. This connection survives controlling for a large range of individual characteristics. The connection also holds when we instrument for apartment-residence using the average apartment residence of the individual's state-city size cell and various interactions of this average with other demographic characteristics. As one would expect, building structure has no effect on participation in national politics. Unsurprisingly, house-dwellers are also more likely to garden and engage in yard work and this connection with the outside physical environment may explain why house-dwellers are more involved in local politics.

Our second question is whether apartments lead to more social connection or more anonymity. Individuals in multi-unit dwellings are physically more proximate to their neighbors. As

physical distance tends to deter interaction, one might expect therefore that apartment-dwellers are more connected with their neighbors. On the other hand, stories about the anonymous nature of life in big apartment buildings also abound. People in single-family detached homes might have more connection with their neighbors because of shared outside space that leads to interaction.

We find that individuals in large apartment buildings are more likely to socialize with their neighbors. They also socialize in public spaces in the neighborhood. Again, this connection appears robust to an instrumental variables strategy. It is also robust to estimation using individual fixed effects utilizing German data. This extra socialization with neighbors appears to crowd out other forms of social activity such as attending church or seeing relatives.

Our third question is whether building structure influences crime. There are two potential reasons why multi-unit dwellings might be associated with more crime: density and distance from the street. Higher density in large dwellings might lead to greater returns from criminal activity, or perhaps residents tend to free ride and not take care of security. Second, distance from the street might be important in that when residents are more separated from the public spaces that surround them, it is harder to observe crime or to intervene to stop criminal activity (see the discussion in Jacobs, 1961).

We find that street crime is much higher for residents of taller, larger buildings. This is true both for robberies and auto thefts in the Uniform Crime Reports (UCR). The National Crime Victimization Survey (NCVS) shows a very powerful connection between the probability of victimization and building size. Using the American Housing Survey, we find that this effect is more closely connected with building height than building size, which suggests the importance of proximity to the streets in making those streets safe.

The findings of this paper confirm the general importance of space and housing in driving social interactions. Housing structure appears to effect citizenship, social interaction and the crime rate. While these results certainly do not lead to a clear policy endorsement, they do have a clear policy implication. When designing policies that effect housing structure, the government needs to consider the effects of housing structure on social relationships.

In Section II, we first discuss the theoretical connection between citizenship and housing structure and then we test the hypotheses generated by this discussion. In Section III, we test whether social connection rises or falls in multi-unit dwellings. In Section IV, we examine the connection between building structure and crime. In Section V, we conclude.

II. Building Structure and Citizenship

In this case, we discuss why we might expect building structure to affect social capital. We then present our empirical results.

Why Would Building Type Affect Social Capital?

The mechanisms through which homeownership might be expected to affect citizenship are relatively straightforward (see DiPasquale and Glaeser, 1999, for a discussion).[1] Homeownership creates incentives to improve one's neighborhood because homeowners have a significant asset, the value of which is tied to the quality of the community. Homeownership also creates barriers to mobility. Lower levels of mobility also create incentives to invest in social capital. When someone expects to live longer in a community, the incentives to invest in that community become stronger.

The connections between building structure and community quality are more elusive.[2] One possible theory is that high-rise apartments provide more of a cocoon from the outside world than single-family homes. Thus, actions in the street (i.e. the presence of trees or construction) might be more directly relevant to a person in a detached home than to a person on the fifth floor of an apartment building. The same argument applies to the actions of neighbors. If a neighbor changes a third floor roof into a deck, this will not matter to someone who lives on the fifth floor of an apartment building. However, the new deck would influence someone who lives in a three story home because of the lost privacy in the house and the yard and because of any visual externalities which might come from the deck. If the neighbors of single-family homeowners create more externalities, then it is natural to expect that single-family homeowners will be more likely to act politically to attempt to correct these externalities.

[1] Rossi and Weber (1996) also provide evidence on this topic.

[2] The theories that we discuss are all tied to simple economics. More complicated theories also connect housing choice and political behavior, such as ideas about how crowding can alter preferences. The research on crowding (for example Freeman et al., 1972) has basically failed to find a significant connection between crowding and political behavior.

A second, perhaps more important, reason why single family homeowners might be more involved in local politics is that in large apartments the division of labor begins to operate and political functions are taken over by apartment managers. Few residents of large apartment building are directly involved with problems relating to sewage or flood conditions during storms. If the apartment building is effected by these concerns, then there will be a professional who handles the problem. Single-family homeowners do not hire professionals because the fixed costs of having a specialized outsider to handle sewage relations for a particular house would exceed any possible gains from specialization.[3]

Thus there are two reasons why single-family homeowners might be expected to be more involved in local politics. First, they have more connection to surrounding public services and the actions of neighbors. This connection to things that are governed by local politics means that the returns to local political activity should rise. Second, residents of large apartment buildings hire specialists who handle their political involvement for them. These specialists do not work for residents of single-family homes because it would not pay to have a specialist work on the political needs of a single home.

Table 1

Table 1 presents a basic series of facts from the National Opinion Research Center's General Social Survey (GSS). The GSS is an annual survey given to between 1,500 and 2,500 persons since 1973. The survey attempts to be a representative sample of the United States. The General Social Survey is particularly valuable because it has a wide range of both economic and social variables. One unfortunate aspect of this survey is that the same questions are not asked in all of the years. Rather than aim for an impossible consistency by keeping the number of observations constant across tables and regressions, we just included as much data as possible.

We have divided the data into three groups. The first group does not inhabit an apartment building (i.e. they have less than 5 units in their buildings). The second group inhabits an apartment building with between 5 and 9 units. The third group lives in "big apartments" which are defined as apartments with more than 10 units. These cutoffs are provided by the GSS and

[3] There is a question about why groups of single-family home owners don't get together and hire a specialized consultant. The natural explanation for this is that because of lower densities for these individuals, any large group has so much heterogeneity that there is not the same benefit from having a single specialized professional.

since this survey was not designed to address housing issues, it does not have more helpful building structure measures.

The first row in the table shows the basic connection between home ownership (which could mean ownership of an apartment) and structure type. Almost 84 percent of the respondents living in single family detached dwellings are also homeowners. Less than 15 percent of either type of apartment dwellers are homeowners. The majority of our sample will be homeowners. The sample of apartment residents is about one-fourth of the size of the sample of single family dwelling residents. The big apartment building residents are rarer still.

The second and third rows of the table give basic demographics of the different types of building residents. Residents of apartment buildings are slightly less likely to be male. They are much less likely to be married. 73 percent of single family home residents are married. Around 40 percent of the apartment dwellers are married. Residents of apartments are also more likely to be black. Since these figures are so different for the different building structures, we will certainly need to control for gender and marital status in our later empirical work.

In the fifth row, we find that residents of medium size apartments are much more likely to be young (under 30) than residents of homes. Surprisingly, residents of big apartment buildings are likely to be older than residents of smaller apartment buildings. This is a surprising fact that probably bears more investigation.

The sixth and seventh rows investigate education. Interestingly, residents of big apartment buildings are more likely to be high school dropouts and more likely to be college graduates. We suspect that this dichotomy reflects the inequality that is present in dense cities and perhaps the role of public housing, where less advantaged people end up living in very tall buildings. Alternatively this result may just come from apartment dwellers being young and younger people having more education. Residents of medium sized apartment buildings are slightly better educated than the residents of homes. This again may be due to the younger age of residents of those structures. The eighth row shows that apartment dwellers tend to be poorer.

The ninth row shows that they have fewer children. It is unsurprising that people with children choose to consume the greater amount of space that is generally inherent in buying a house rather than an apartment.

The tenth row shows the unsurprising result that apartment dwellers live in big cities. Naturally, higher land prices in those areas cause developers to build up rather than using more land. Again, this is a variable that will be important to control for in our later regressions.

The next set of rows show the dependent variables that we will consider elsewhere in the paper. Since we believe that it is important to control for demographic and other characteristics when we compare residents of houses and apartments, we will refrain from discussing these results here. The most important thing to take away from the remaining rows of the table is that every result that appears in our regression setting also appears in the basic means.

Table 2

Table 2 shows our first set of results using regression analysis. In this table, we show the effects of building structure (and other variables) holding all other variables constant. In practice, we estimate a regression of the form:

$$(1) \quad \begin{aligned} Outcome_i = a + b * Apartment_i + c * Big\ \ Apartment_i + d * mobile\ home_i + \\ e * 2-3\ family_i + Other\ \ \ Controls \end{aligned} .$$

The coefficients b and c show the effect of apartment status relative to the residents of single family detached dwellings and holding everything else constant. In the bulk of our regressions, the variable takes on values of one or zero only. In those cases, we have estimated probit regressions. We do not report probit coefficients but rather the estimated marginal impact of a change in the independent variable on the dependent variable.

In the GSOEP, we run individual fixed effects regressions of the form:

$$(2) \quad \begin{aligned} Outcome_{i,t} = a_i + b * Apartment_{i,t} + c * Big\ \ Apartment_{i,t} + d * mobile\ home_{i,t} + \\ e * 2-3\ family_{i,t} + Other\ \ \ Controls \end{aligned}$$

The term a_i refers to the fact that we allow for an individual-specific intercept term. This term means that when we estimate the connection between apartment residence and the relevant

outcome variable, we are testing whether individuals who have moved from single family homes to apartments see a change in the outcome variable. The presence of the individual specific intercept means that we have controlled for the possibility that individuals who own apartments are just innately different from people who own single family homes.[4]

Columns (4) and (6) of Table 2 show the connection between apartment residence and gardening. Column (4) shows that people who live in apartment buildings with 10 or more units are 25 percent less likely to garden than people who live in single family detached homes. Column (6) shows that people who switch into apartment buildings in the GSOEP are 10 percent less likely to garden. The bulk of the difference between the results occurs because we are controlling for individual-specific fixed effects in the German data and not in the U.S. The strong connection between apartment residence and gardening is obviously not itself a test of citizenship. However, this evidence does support the specialization argument made above—people in multi-person structures are more likely to have professionals help than to do things themselves. The greater level of gardening is one way in which residents of houses interact with their neighbors and with the public space that surrounds them.

Column (1) presents our first test of whether architecture affects citizenship. Our dependent variable is whether you have ever voted in local elections. As in DiPasquale and Glaeser (1999), homeownership has a significant positive effect on this variable. Education and income also positively influence this social capital variable. Most of the other control variables are insignificant, including marital status and number of children.

Apartment status strongly, negatively affects this variable. Residents of big apartment buildings are 16.8 percent less likely to vote in local elections. Residents of mobile homes are 14.9 percent less likely. Interestingly, there is only an insignificant negative effect of small apartments on this social variable. Perhaps, it is the residents of the biggest apartment buildings who are most separated from the political issues that surround them.

The next regression show results for a less precise question, which asks respondents if they have worked to solve local problems. While there is a significant effect of homeownership on this variable, there is not a significant effect of either building structure variable. If both apartment types are grouped together, we find that living in a single family detached home is significantly

[4] Of course, it is possible that the change in building status is accompanied by other changes which we do not

positively related to working to solve local problems. As usual, education is also a very strong predictor of this outcome variable.

Column (3) shows the results for voting in the most recent national election. Since theory predicts more activity in local, not national, elections, we see this regression as a placebo and we expect no connection. Indeed, apartment residence is insignificantly positively connected with voting in national elections. Living in a mobile home does, however, negatively predict voting in the presidential election. This leads us to suspect that the mobile home results are quite possibly the result of omitted personal characteristics that are correlated with living in a mobile home.

Column (5) shows the effect of apartment status on involvement in local politics using the German Socio-Economic Panel (GSOEP). This data set, of course, may be slightly less comparable because it relates to Germany rather than the United States.[5] As before, we are controlling for individual fixed effects. In this regression, apartment status has a negative impact on political involvement but this impact is not statistically significant. When we run these regressions without individual fixed effects, we do find that apartment status significantly effects the citizenship variable.

Table 3—Addressing Endogeneity

In Table 3, we address the endogeneity of apartment structure. One problem with the previous regressions is that housing choice is itself endogenous. As such, more politically involved persons may just choose to live in single family detached homes and our previous results could be spurious. To control for this possibility, we follow an instrumental variables strategy.

Our basic instrument follows DiPasquale and Glaeser (1999) and uses the housing structure of the geographic area in which the person resides. Our instrument is formed by considering the average level of the apartment variables in the state-city size quartile in which the person resides (based on the GSS). In other words, we use the average probability of living in an apartment in the person's state in cities which fall in a particular size category (e.g. top quartile of the state,

observe. This would lead to biased coefficients.

[5] The German housing market is substantially different from that of the United States. Homeownership rates are lower, homes are smaller and more people live in apartments (see DiPasquale and Glaeser, 1999, for further discussion of these differences).

etc.).[6] Naturally, we will continue to control for city size itself (and almost all of our other variables). We also use interactions of this variable with other exogenous characteristics of the person to instrument for whether the person lives in an apartment. This instrument will be acceptable as long as location is not itself determined by citizenship.

In Table 3, we make two added changes to our basic specification. Because of the usual difficulties performing two-stage least squares with a probit specification, everything is done with ordinary least squares. We have also grouped our two apartment variables to get more precision. Finally, we have dropped homeownership as a control variable. We needed to drop homeownership, because at the location level homeownership and apartment status is particularly highly correlated. We have run our specifications both in ordinary least squares specification and using instrumental variables to facilitate the comparison of coefficients.

In regressions (1) and (2), we revisit the connection between apartment status and voting in local elections. As in Table 2, the basic effect is quite strong. Using instrumental variables barely changes the coefficient although the standard error does increase. Regression (3) and (4) look at working to solve local problems. The ordinary least squares results are significant here (as opposed to Table 2) because we combine the two apartment variables and because we exclude homeownership. Again, using the instrumental variables specification increases the standard error but barely moves the coefficient. We conclude that the results are robust to this alternative specification.

Overall, we believe that there is a weak, negative relationship between apartment residence and local citizenship. We have three regressions that focus on local citizenship and of these, only one yields a strongly significant result. The German data is significant if we do not include fixed effects and all apartment status effects are negative. Still, it is hard to believe that apartment status compares with homeownership as a determinant of citizenship.

III. Buildings and Social Connection

In this section, we discuss the connection between building structure and various forms of social connection.

[6] We do not use the individual's own observation in forming this average.

Why Would Building Type Affect Social Connection

The basic theory about why building type might effect social connection is extremely simple. Large buildings have less physical space between residents. Even if each housing unit is the same size, and if there is the same amount of land area per person, when individuals are in a large apartment building there will be less distance between them than if the same people lived in single family detached dwellings that are each surrounded by their own plot. The simplest theories of social connection suggest that social connection declines as the costs of that connection increase and that distance will increase the costs of that connection.

Indeed, there is a wide range of evidence supporting the point that even modest distances seriously decrease social interaction (Baldassare, 1979, provides a survey, Festinger et al., 1950, is a classic study). The General Social Survey asks how often you see your closest friend and how far the trip is to that friend. The correlation between these variables is -64 percent. The correlation between distance to your closest relative and frequency of visiting that relative is –73 percent. Reductions in physical distance between neighbors in apartment buildings could very well drive up social interaction between neighbors. This effect will be augmented by the fact that people in apartment buildings are likely to use common spaces such as entryways and elevators.

Alternatively, there are arguments about single-family homes creating more connection between neighbors. Most of these arguments tend to focus on other attributes of the residents detached houses (i.e. their tenure in the community) rather than housing structure itself. However, in principle it is still possible that the common areas surrounding detached homes lead to high levels of interaction and more neighborliness.

A second effect of apartments comes from the lack of space in smaller building units. In smaller living units, using public spaces outside of the home will become more desirable. For example, it will be more attractive to go out to eat or drink or recreate, if the individual has less space inside the home. It may be that recreating outside of the home leads to more social interactions with neighbors. This force may also explain the finding of Green and White (1998). Homeowners may have more successful children, because greater interior space leads to these people spending more time at home.

Of course, if either detached houses or apartments lead to more socializing with near neighbors, this may crowd out socializing along other fronts. As such we should expect that whichever group socializes more in their own area should do less socializing elsewhere. This may have positive or negative social effects depending on whether socializing with neighbors is more beneficial for the community as a whole, than socializing with others.

Table 4

In this table, we examine the correlation between social connection and building structure. In the first regression using the General Social Survey, we explore the determinants of socializing with a neighbor. This variable is on a one to seven scale, where one refers to never going out and seven refers to always going out. Individuals who live in big apartments are much more likely to spend an evening out with someone from the neighborhood. City size seems to be negatively associated with this variable, big apartment building residence is positively associated with this variable. Living in a moderately sized apartment building is also significantly associated with this variable. This result is important because it suggests that big apartment buildings are associated with community, not anonymity. This finding supports the basic view that transportation costs play a major role in determining social interactions.

The second regression repeats this regression where we have used going to a bar or tavern as the dependent variable. We see this variable as a measure of socializing in public spaces outside of the home, and our discussion predicted that people in apartments would be more likely to use these external public spaces. Again the outcome variable is on a one to seven scale. People in big apartment buildings are more likely to use these public spaces.

In regressions (6) and (7), we consider similar variables using the GSOEP. We again use this data set to control for individual fixed effects, which means that our results are not being driven by the fact that apartment-dwellers are intrinsically different from people in detached homes. In regression (6), we look at attending cultural events. In regression, (7) we look at spending the night out. Both of these variables show recreation in external public spaces that might lead to more contact with neighbors. People in big apartment buildings are more likely to attend cultural events and they are more likely to spend the night out. This again supports the basic hypothesis that social interactions are a function of housing structure.

Regions (3), (4) and (5) show the effects of apartment status on socializing with relatives and going to church. Regression (3) shows that in the General Social Survey people living in apartment (but not big apartments) are less likely to socialize with relatives. One explanation for this is that other forms of socialization are crowding out seeing relatives.

Regression (4) shows that church attendance is lower for people in big apartments. Regression (5) confirms the church attendance—apartment status results. The negative connection between living in a big apartment and going to church is quite robust. Our best explanation of this is that other social activities in big apartments crowd out churchgoing, but we believe that this is only part of the answer. Hopefully future research will address this question more fully.

We are more confident with our results on social connection and apartment status than we are with our results on local political involvement and apartment status. People in apartments are more likely to socialize with neighbors, spend nights out and go to cultural events. The absence of distance to neighbors and to exterior public events seems to be important. However, these increases in sociability appear to drive out other forms of social interaction such as church going and seeing relatives.

IV. Buildings and Crime

Finally, we address the connection between building structure and crime.

Why Would Building Structure Affect Crime?

Perhaps the most natural theory about why building structure, and in particular, large apartments might affect the crime rate is that building structure determines the access to living space. According to different versions of this theory, either apartments or single-family homes are more accessible to potential burglars. Apartments may be more accessible if the building itself is not well defended. Alternatively, if apartment buildings have doormen or solidly locked external doors, it may be that apartment buildings are harder to enter. Both versions of this theory suggest that building structure should be particularly important in creating crimes against the home.

A second reason that building structure might effect crime is that densities are higher with apartment buildings. Crime is an activity where "transport" costs are very high. In other words, criminals do not appear to travel far away from their place of residence even when the financial inducements would appear to be quite strong. Criminals will have greater access to victims in dense areas, because transport costs, to victims will be lower and more crimes will occur. Big apartment buildings will be associated with a steady stream of people over a particular area and as such present an easy target for criminals who want to engage in crime against people.[7]

Jacobs (1961) emphasizes the connection between citizens and the streets. She argues that density is not a problem, and indeed high density areas might be safer. However, she emphasizes the important role that private monitoring can play in stopping crime. One major effect of tall apartment buildings is that it greatly increases the physical distance between the average apartment and the street below. If people themselves are the most important policing force, then distance between residential quarters and public space may lead to much less policing and much more crime. This theory predicts that it is height rather than building size, which will lead to more crime.

A final theory argues that density changes human behavior and leads to more aggression. Following Lorenz (1966) there was a great bout of research on this topic and the evidence is mixed at best. However, to the extent that we observe a connection between dense large apartment buildings and crime, it might be related to this type of force.

Tables 5 and 6

In Table 5, we examine the connection between apartment status and crime using the Federal Bureau of Investigation's Uniform Crime Reports. The Uniform Crime Reports represent the amount of reported crime in all larger jurisdictions within the U.S. This regression is run at the city level and the key independent variable is the share of the population living in apartment buildings. We examine crime rates (per capita) across all cities (where data is available) with more than 25,000 inhabitants.

[7] Of course, there are many mechanisms through which this process may work. Close proximity of crime-prone persons may lead to congestion of law enforcement and lower arrest rates. Alternatively, crime-prone persons may teach each other crime-related skills or act to legitimize crime-related activities.

The first regression shows no connection between overall serious crimes and percent of population living in multi-unit dwellings. The overall serious crime measure is driven primarily by petty larceny (which is theft without threat of violence) and this larceny measure is indeed uncorrelated with building structure. While crime rises with city size, it does not rise in multi-unit dwellings. The second regression shows the connection between burglaries and apartment buildings. Again, there is no significant correlation.

The third and fourth regressions look at two particular forms of crime that are particularly likely to occur on the street. The third regression looks at robberies. These are crimes which involve threat of violence and typically occur on the street. There is a very strong connection between multi-unit dwellings and robberies. The fourth regression examines auto thefts, another street crime. Again, multi-unit dwellings strongly predict auto thefts.

Overall, Table 5 suggests that there is no general connection between crime and multi-unit dwellings. There is particularly no connection between burglaries and multi-unit dwellings. However, there is a strong connection between street crimes (i.e. robberies and auto theft) and multi-unit dwellings. This seems to support the idea that the distance between residents and the neighborhood means that the streets are less safe with big apartment buildings.

Table 6 examines this hypothesis more closely using data from the National Crime Victimization Survey and the American Housing Survey. The National Crime Victimization Survey asks respondents whether or not they have been victimized over the six months prior to the interview. The NCVS also asks about building structure and public housing, as well as individual demographics. In the NCVS regressions we define big apartment buildings as those with 10 or more units, and apartment buildings as those with 5-9 units.

Regression (1) shows a strong positive coefficient of big apartment building residence on being victimized. This coefficient is quite strong. The coefficient means that the predicted level of victimization is 6.7 percent greater in a big apartment building relative to living in a single family detached house. There is also a significant positive effect of living in a smaller apartment building. Interesting, public housing is associated with less victimization, rather than more. It is also true that minority status is not associated with more victimization in this data. If we did not control for the other variables (particularly income, age and poverty status), public housing and minority status would continue to have their expected signs.

The second regression shows that there is no apartment effect on being victimized in a "house crime," where a house crime is defined as either a burglary or a crime that took place in your own house. Big apartment buildings do not lead to unsafe residences.

Regression (3) shows people in big apartment buildings are much more likely to be victimized by a crime against their person. These crimes are again most likely to happen on streets surrounding one's place of residence. From this we conclude that the apartments are themselves just as safe as houses. However, the shared common spaces and dense areas around apartment buildings are more likely to have victimization.

The fourth and fifth regressions show results for the American Housing Survey. This survey contains much better information about a wide range of housing characteristics. However, it does not actually contain victimization data. Instead, it contains the resident's assessment of the level of street crime in the neighborhood. This is a 0-1 variable with 0 meaning that street crime is not a problem and 1 meaning that street crime is a problem.

In regression (4), we show that people living in either type of apartment are more likely to face street crime. In this data set we are also able to control for public housing and find that there is substantially more street crime reported around public housing units. There is no significant difference between big apartment buildings and apartments generally.

In regression (5) we separate out the role of floors with the role of units. This helps to distinguish between the role of building size and the role of distance from the ground. In this survey, we find that the important variable for explaining street crime is the number of floors not the number of units. This means that the connection between crime and apartment buildings appears to have more to do with height than with the number of residents.

There is a fairly persistent connection between street crime and building structure. Big, and particularly, tall apartment buildings are associated with less safe streets. We suspect that this comes from the greater distance between people and the streets in big buildings.

V. Conclusion

This study found that building structure matters for behavior in ways that correspond with simple economic ideas. Large apartment buildings appear to have two important effects on behavior. First, they reduce the distance between neighbors. Second, they increase the distance between residents and the streets.

Because of these two different effects, the impact of apartments on behavior is often subtle. Apartment buildings increase the social connection between neighbors but reduce individual involvement in local politics. Apartment buildings increase recreation outside of the home in some ways, but also reduce church attendance. Most strikingly, big apartment buildings are strongly associated with street crime. This is most probably the effect of distance between where people live and the streets.

These subtle, but quite significant, connections between housing structure and important social outcomes suggest that housing must be integrated into a wide range of social policies. However, there is no clear policy implication of this research other than housing must be taken seriously and studied further.

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Table 1:
Means From the GSS By Type of Housing

	House	Apartment	Big Apartment Building
own home	0.839	0.147	0.127
	(0.368)	(0.354)	(0.333)
	8347	2188	536
male	0.441	0.408	0.364
	(0.497)	(0.492)	(0.481)
	14386	3698	902
married	0.732	0.377	0.407
	(0.443)	(0.485)	(0.492)
	14384	3697	901
black	0.115	0.237	0.276
	(0.320)	(0.425)	(0.447)
	12685	3182	739
age less than 30	0.163	0.383	0.226
	(0.370)	(0.486)	(0.419)
	12652	3168	729
high school graduate	0.555	0.559	0.434
	(0.497)	(0.497)	(0.496)
	12657	3174	735
college graduate	0.208	0.240	0.273
	(0.406)	(0.427)	(0.446)
	12685	3182	739
income (1=under $1000, 12=$25000+)	9.580	8.635	8.001
	(3.792)	(3.731)	(4.177)
	14170	3655	870
number of children	2.149	1.387	1.488
	(1.783)	(1.701)	(1.844)
	14330	3691	899
log (city size)	3.098	4.421	6.158
	(1.872)	(1.982)	(2.373)
	14386	3698	902
vote in local elections	0.741	0.545	0.537
	(0.438)	(0.499)	(0.502)
	1127	290	82
knows name of head of local school system	0.369	0.173	0.152
	(0.483)	(0.379)	(0.361)
	1120	283	79
help solve local problems	0.382	0.238	0.301
	(0.486)	(0.427)	(0.462)
	1135	290	83

Table 1, page 2:
Means From the GSS By Type of Housing

	House	Apartment	Big Apartment Building
knows name of his/her U.S. Congressman	0.407	0.223	0.266
	(0.491)	(0.417)	(0.445)
	1116	283	79
owns a gun	0.532	0.195	0.106
	(0.499)	(0.396)	(0.308)
	9497	2478	615
spend social evening with someone from neighborhood (1-7 lowest to highest freq.)	3.343	3.846	4.054
	(1.940)	(2.141)	(2.066)
	9558	2464	570
spend social evening with relatives (1-7 lowest to highest freq.)	4.508	4.390	4.345
	(1.585)	(1.663)	(1.669)
	9559	2463	571
go to a bar or tavern (1-7 lowest to highest freq.)	2.257	2.810	2.507
	(1.677)	(1.883)	(1.872)
	9552	2462	568
spend social evening with friend outside neighborhood (1-7 lowest to highest freq.)	3.980	4.300	4.030
	(1.569)	(1.629)	(1.742)
	9565	2464	570
afraid to walk alone at night	0.391	0.509	0.668
	(0.488)	(0.500)	(0.471)
	9552	2465	606
gardens	0.703	0.351	0.161
	(0.457)	(0.478)	(0.371)
	1036	265	56
frequency of church attendance (0=never, 8=more than 1x per week)	4.160	3.622	3.376
	(2.681)	(2.572)	(2.643)
	14206	3663	886
number of non-professional organizations	1.812	1.608	1.454
	(1.833)	(1.805)	(1.661)
	7495	1830	421

Table 2:
The Connection between Citizenship and Architecture

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
	Votes in local elections	*Works to solve local problems*	*Voted in most recent Pres. election*	*Gardens*	*Is involved in local politics*	*Does yard work*
data set	*GSS*	*GSS*	*GSS*	*GSS*	*GSOEP*	*GSOEP*
estimation procedure	*probit*	*probit*	*probit*	*probit*	*OLS w/ fixed effects*	*OLS w/ fixed effects*
big apartment	-0.168	-0.066	0.011	-0.251	-0.004	-0.099
(10+ units in bldg)	(0.076)	(0.063)	(0.025)	(0.106)	(0.007)	(0.010)
apartment	-0.033	-0.075	0.009	-0.113	-0.005	-0.079
(5-9 units in bldg)	(0.040)	(0.037)	(0.014)	(0.054)	(0.005)	(0.007)
mobile home	-0.149	-0.035	-0.081	-0.015		
	(0.058)	(0.051)	(0.019)	(0.065)		
2-4 family bldg, misc.	0.013	-0.099	0.002	0.001		
	(0.044)	(0.042)	(0.017)	(0.067)		
own home	0.118	0.069	0.118	0.143	0.006	0.071
	(0.034)	(0.033)	(0.013)	(0.045)	(0.005)	(0.007)
male	-0.019	0.017	-0.023	-0.121		
	(0.024)	(0.024)	(0.009)	(0.033)		
black	0.001	0.017	0.037	-0.170		
	(0.029)	(0.030)	(0.012)	(0.059)		
age less than 30	-0.453	-0.117	-0.288	-0.086		
	(0.043)	(0.037)	(0.017)	(0.057)		
married	-0.038	-0.014	0.003	0.120	-0.001	0.036
	(0.028)	(0.029)	(0.010)	(0.039)	(0.004)	(0.006)
high school graduate	0.151	0.171	0.151	0.042	-0.037	0.024
	(0.030)	(0.029)	(0.011)	(0.045)	(0.011)	(0.015)
college graduate	0.256	0.324	0.247	0.068	-0.054	-0.040
	(0.026)	(0.043)	(0.009)	(0.053)	(0.013)	(0.020)
income	0.012	-0.013	0.008	-0.017		
	(0.006)	(0.006)	(0.002)	(0.009)		
number of children	0.009	0.010	-0.008	0.014	-0.006	-0.013
	(0.007)	(0.007)	(0.003)	(0.011)	(0.003)	(0.005)
age 30-39	-0.300	-0.050	-0.240	0.010		
	(0.043)	(0.036)	(0.016)	(0.050)		
age 40-49	-0.186	0.043	-0.141	0.054		
	(0.046)	(0.039)	(0.017)	(0.051)		

Table 2 (page 2)

age 50-59	-0.023	0.080	-0.082	0.054		
	(0.048)	(0.044)	(0.018)	(0.055)		
log (city pop.)	0.007	0.007	0.003	-0.020		
	(0.007)	(0.007)	(0.003)	(0.010)		
dummy for no income	0.031	-0.122	0.076	-0.190		
	(0.062)	(0.055)	(0.021)	(0.105)		
dummy for high income	-0.018	0.058	0.028	0.133		
	(0.035)	(0.035)	(0.013)	(0.049)		
city	-0.106	-0.001	0.010	0.067		
	(0.039)	(0.036)	(0.014)	(0.054)		
suburb	-0.058	-0.046	-0.001	-0.022		
	(0.027)	(0.026)	(0.010)	(0.035)		
R-squared	.15	.07	.10	.13	.03	.08
N	1736	1751	11,250	1054	75,780	119,268

Regressions 1-4 are probits. dY/dX is shown. Regressions 5,6 are OLS w/ fixed effects due to the computational problems of running probits w/ fixed effects.

Other controls included:

Reg 5-6: Fixed effects for individuals, state dummies, year dummies, income. N shown is persons*years. Persons=19,328.

Table 3:
Treating Housing Choice as Endogenous

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
	Votes in local elections	*Votes in local elections*	*Works to solve local problems*	*Works to solve local problems*	*Social evening w/. person from neigh*	*Social evening w/. person from neigh*
data set	*GSS*	*GSS*	*GSS*	*GSS*	*GSS*	*GSS*
estimation procedure	*probit*	*I.V. 2SLS*	*probit*	*I.V. 2SLS*	*OLS*	*I.V. 2SLS*
any apartment	-0.125	-0.113	-0.112	-0.096	0.420	0.560
(5+ units in bldg)	(0.035)	(0.079)	(0.030)	(0.083)	(0.049)	(0.179)
mobile home	-0.142	-0.294	-0.031	-0.108	0.229	1.038
	(0.057)	(0.156)	(0.051)	(0.160)	(0.072)	(0.294)
2-4 family bldg, misc.	-0.041	0.054	-0.126	-0.162	0.147	0.028
	(0.044)	(0.158)	(0.038)	(0.166)	(0.065)	(0.324)
male	-0.019	-0.013	0.015	0.017	0.150	0.142
	(0.024)	(0.022)	(0.024)	(0.023)	(0.036)	(0.036)
black	-0.003	-0.015	0.018	0.015	0.204	0.228
	(0.029)	(0.027)	(0.030)	(0.029)	(0.055)	(0.056)
age less than 30	-0.478	-0.427	-0.130	-0.127	0.261	0.240
	(0.040)	(0.039)	(0.036)	(0.041)	(0.058)	(0.062)
married	-0.023	-0.017	-0.005	-0.003	-0.199	-0.188
	(0.028)	(0.028)	(0.028)	(0.029)	(0.043)	(0.049)
high school graduate	0.152	0.125	0.172	0.162	0.041	0.069
	(0.030)	(0.027)	(0.029)	(0.029)	(0.046)	(0.047)
college graduate	0.259	0.259	0.325	0.292	0.143	0.190
	(0.026)	(0.038)	(0.042)	(0.040)	(0.059)	(0.063)
income	0.014	0.014	-0.011	-0.011	-0.039	-0.038
	(0.006)	(0.006)	(0.006)	(0.006)	(0.009)	(0.010)
number of children	0.007	0.006	0.009	0.009	-0.037	-0.036
	(0.007)	(0.007)	(0.007)	(0.007)	(0.011)	(0.012)
age 30-39	-0.327	-0.262	-0.066	-0.065	-0.048	-0.060
	(0.041)	(0.034)	(0.035)	(0.036)	(0.055)	(0.056)
age 40-49	-0.204	-0.158	0.032	0.036	-0.161	-0.164
	(0.046)	(0.035)	(0.039)	(0.037)	(0.058)	(0.059)

Table 3 (page 2)

age 50-59	-0.032	-0.031	0.073	0.075	-0.181	-0.184
	(0.048)	(0.038)	(0.043)	(0.040)	(0.062)	(0.062)
log (city pop.)	0.004	0.003	0.007	0.005	-0.062	-0.055
	(0.006)	(0.007)	(0.006)	(0.007)	(0.010)	(0.015)
dummy for no income	0.049	0.061	-0.103	-0.100	-0.409	-0.367
	(0.060)	(0.066)	(0.057)	(0.069)	(0.100)	(0.111)
dummy for high income	-0.011	-0.012	0.067	0.060	0.037	0.080
	(0.035)	(0.033)	(0.035)	(0.035)	(0.052)	(0.058)
city	-0.095	-0.089	-0.005	-0.004	-0.145	-0.120
	(0.038)	(0.035)	(0.035)	(0.037)	(0.057)	(0.060)
suburb	-0.045	-0.053	-0.047	-0.047	-0.169	-0.152
	(0.027)	(0.025)	(0.025)	(0.026)	(0.039)	(0.039)
R-squared	.14	.16	.07	.08	.04	.03
N	1740	1740	1755	1755	13031	13031

Regressions 1,3 are probits. dY/dX is shown.

Instruments used for big apartment, apartment, 2-4 family: 1.) state averages of these variables by city size quartile (excluding own obs.), 2.) interaction of these state averages w/ the other exogenous r.h.s. variables, 3.) fitted values from probits of endogenous variables on the exogenous r.h.s. variables

Table 4:
The Connection between Social Behavior and Architecture

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*
	Social evening w/. person from neigh	***Go to tavern or bar***	***Social evening w/. relative***	***Attend church***	***Attend church***	***Attend cultural events***	***Spend night out***
data	***GSS***	***GSS***	***GSS***	***GSS***	***GSOEP***	***GSOEP***	***GSOEP***
estimation proced	***OLS***	***OLS***	***OLS***	***OLS***	***OLS, F.E.***	***OLS, F.E.***	***OLS, F.E.***
big apartment	0.781	0.233	-0.033	-0.430	-0.049	0.025	0.047
(10+ units in bldg)	(0.122)	(0.095)	(0.097)	(0.144)	(0.012)	(0.008)	(0.027)
apartment	0.416	0.194	-0.093	-0.081	-0.020	0.007	0.030
(5-9 units in bldg)	(0.070)	(0.054)	(0.055)	(0.083)	(0.010)	(0.006)	(0.020)
mobile home	0.219	0.086	-0.065	-0.497			
	(0.083)	(0.064)	(0.066)	(0.100)			
2-4 family bldg, misc	0.108	0.149	0.112	-0.188			
	(0.083)	(0.064)	(0.066)	(0.098)			
own home	0.062	-0.073	0.176	0.336	0.008	-0.010	0.006
	(0.059)	(0.046)	(0.047)	(0.070)	(0.008)	(0.006)	(0.018)
male	0.168	0.611	-0.238	-0.664			
	(0.042)	(0.033)	(0.033)	(0.050)			
black	0.185	-0.283	0.315	0.983			
	(0.069)	(0.053)	(0.054)	(0.075)			
age less than 30	0.308	1.100	0.695	-0.601			
	(0.072)	(0.056)	(0.057)	(0.085)			
married	-0.188	-0.742	0.057	0.551	0.000	-0.044	-0.116
	(0.050)	(0.039)	(0.040)	(0.060)	(0.009)	(0.006)	(0.051)
high school graduate	0.075	0.258	-0.063	0.531	0.058	-0.014	-0.199
	(0.055)	(0.043)	(0.044)	(0.065)	(0.020)	(0.013)	(0.047)
college graduate	0.166	0.364	-0.325	0.922	0.063	-0.061	-0.056
	(0.070)	(0.054)	(0.055)	(0.082)	(0.024)	(0.016)	(0.428)
income	-0.035	0.027	0.014	0.021			
	(0.012)	(0.009)	(0.009)	(0.014)			
number of children	-0.025	-0.013	0.057	0.096			
	(0.014)	(0.011)	(0.011)	(0.016)			
age 30-39	-0.006	0.893	0.310	-0.776			
	(0.065)	(0.051)	(0.052)	(0.078)			
age 40-49	-0.118	0.608	0.027	-0.642			
	(0.068)	(0.053)	(0.054)	(0.081)			

Table 4 (page 2)

age 50-59	-0.182	0.314	0.003	-0.466			
	(0.073)	(0.057)	(0.058)	(0.087)			
log (city pop.)	-0.062	-0.003	-0.011	-0.057			
	(0.012)	(0.010)	(0.010)	(0.014)			
dummy for no income	-0.426	0.133	0.190	0.164			
	(0.125)	(0.097)	(0.099)	(0.146)			
dummy for high income	-0.018	0.046	-0.021	-0.127			
	(0.063)	(0.049)	(0.050)	(0.074)			
city	-0.147	0.017	-0.040	-0.029			
	(0.068)	(0.053)	(0.054)	(0.079)			
suburb	-0.145	0.044	-0.031	-0.046			
	(0.046)	(0.035)	(0.036)	(0.054)			
year	-0.023	-0.015	0.004	-0.026			
	(0.006)	(0.005)	(0.005)	(0.008)			
constant	6.021	2.911	3.718	5.758	0.143	0.037	0.116
	(0.575)	(0.446)	(0.456)	(0.703)	(0.291)	(0.266)	(0.428)
R-squared	.04	.21	.04	.09	.04	.01	.02
N	9,470	9,467	9,472	11,151	46,501	65,589	21,580

Dependent variable:

1. OLS: GSS: How often spend a social evening w/ someone who lives in your neighborhood? (0=never, 7=every day)
2. OLS: GSS: How often go to a bar or tavern? (0=never, 7=every day)
3. OLS: GSS: How often spend a social evening w/ relative? (0=never, 7=every day)
4..OLS: GSS, How often do you attend religious services? (0=never, 8=several times per week)
5. OLS w/ fixed effects GSOEP: Attend Church events (0=no, 1=yes)
6. OLS w/ fixed effects GSOEP: Attend Cultural events (0=no, 1=yes)
7. OLS w/ fixed effects GSOEP: Go out to eat or drink (0=no, 1=yes)

Other controls included:

5-7: Fixed effects for individuals, state dummies, year dummies, income. N shown is persons*years. There are 15,913 ; 18,379 and 14,957 people respectively.

Table 5:
The Connection between Crime and Architecture in the Cross City Data

	Ln (Serious Crimes per Capita) OLS	***Ln (Burg-laries per Capita) OLS***	***Ln (Rob-beries per Capita) OLS***	***Ln (Auto thefts per Capita) OLS***
constant	-4.526	-6.382	-11.058	-7.687
	(0.307)	(0.357)	(0.544)	(0.472)
percent in multi-unit dwellings	0.139	0.098	1.758	2.700
	(0.200)	(0.232)	(0.354)	(0.308)
ln (82 pop)	0.087	0.124	0.326	0.179
	(0.016)	(0.019)	(0.029)	(0.025)
% below poverty	0.927	0.993	-3.365	-2.589
	(0.470)	(0.546)	(0.832)	(0.723)
% owner occup'd house	0.238	0.438	0.611	0.836
	(0.229)	(0.266)	(0.405)	(0.352)
% non-white	-0.086	0.182	1.661	0.027
	(0.162)	(0.188)	(0.287)	(0.249)
% w/ 4 years high school	0.201	0.031	-1.039	-1.215
	(0.266)	(0.309)	(0.471)	(0.409)
% w/ 4+ years college	-0.526	-0.770	-1.223	-0.660
	(0.253)	(0.294)	(0.448)	(0.389)
unemploy-ment rate	0.816	0.928	0.581	1.428
	(0.587)	(0.681)	(1.038)	(0.902)
% female headed HH	2.456	2.289	6.928	4.644
	(0.620)	(0.720)	(1.098)	(0.954)
% one person households	1.054	1.175	1.402	-1.401
	(0.335)	(0.389)	(0.592)	(0.515)
north (regional dummy)	-0.339	-0.346	-0.505	-0.057
	(0.050)	(0.058)	(0.088)	(0.077)
south	-0.046	-0.106	-0.318	-0.211
	(0.042)	(0.049)	(0.074)	(0.065)
central	-0.167	-0.289	-0.578	-0.340
	(0.041)	(0.047)	(0.072)	(0.063)
R-squared	.43	.46	.70	.47
N	633	633	633	633

Table 6: The Connection between Crime and Architecture

	(1) *Victim of a crime NCVS probit*	*(2)* *Victim of a house crime NCVS probit*	*(3)* *Victim of a personal crime NCVS probit*	*(4)* *Street Crime in neigh AHS probit*	*(5)* *Street Crime in neigh AHS probit*
big apartment (10+ units in bldg)	0.067 (0.017)	-0.018 (0.010)	0.060 (0.013)	0.051 (0.011)	
apartment (5-9 units in bldg)	0.053 (0.020)	-0.001 (0.013)	0.041 (0.016)	0.050 (0.010)	
mobile home	0.027 (0.036)	0.040 (0.028)	-0.024 (0.022)	.008 (.026)	
2-4 family bldg, misc.	0.003 (0.016)	-0.006 (0.011)	-0.005 (0.011)		
number of floors					0.024 (0.004)
number of units					-0.001 (0.000)
public housing	-0.038 (0.022)	-0.029 (0.014)	0.002 (0.016)	0.105 (0.016)	0.112 (0.018)
below poverty line	-0.042 (0.023)	0.025 (0.020)	-0.057 (0.012)		
family income	0.040 (0.024)	0.021 (0.017)	0.013 (0.017)		
city / non-city dummy	0.000 (0.003)	0.001 (0.002)	-0.002 (0.002)	0.227 (0.011)	0.240 (0.011)
male	0.003 (0.018)	-0.003 (0.013)	0.011 (0.013)	-0.019 (0.009)	-0.018 (0.009)
education in years	0.045 (0.012)	0.016 (0.009)	0.023 (0.008)	0.006 (0.001)	0.007 (0.001)
black	0.002 (0.001)	0.000 (0.000)	0.002 (0.000)	0.073 (0.010)	0.069 (0.011)
hispanic	-0.041 (0.015)	-0.019 (0.010)	-0.022 (0.010)		
has job	-0.059 (0.015)	-0.024 (0.010)	-0.033 (0.010)		
married	-0.011 (0.015)	0.004 (0.010)	-0.011 (0.010)	-0.013 (0.010)	-0.017 (0.010)
number of cars in household	-0.196 (0.012)	-0.079 (0.009)	-0.105 (0.009)		
Log city population	-0.002 (0.006)	-0.005 (0.004)	-0.004 (0.004)		

Table 6 (page 2)

age < 30	0.008	0.005	0.000		
	(0.004)	(0.003)	(0.003)		
age 30-39	0.139	0.028	0.094		
	(0.026)	(0.017)	(0.021)		
age 40-49	0.125	0.037	0.081		
	(0.026)	(0.018)	(0.021)		
age 50-59	0.041	0.003	0.035		
	(0.027)	(0.018)	(0.022)		
R-squared	0.052	0.039	0.001		
	(0.032)	(0.024)	(0.023)		
N	5602	5602	5602	13,927	13,927

NCVS log city pop is estimated from city size categories.

Appendix 1

Building Definitions by Data Source

big apartment:	GSS=5+ units & 4+stories, NCVS=10+ units AHS 15+ units GSOEP 9+ units
apartment:	GSS=5+units & <4 stories, row house, aprt in partly commercial structure NCVS=5-9 units AHS 3-14 units GSOEP 3-8 units
2-3 family/other:	GSS=2 family house, detached 3-4 family house NCVS=2-4 unit structures
mobile home:	trailer or mobile home with or without attached rooms
house:	single family detached