

RESIDENT APPROPRIATION OF DEFENSIBLE SPACE IN PUBLIC HOUSING

Implications for Safety and Community

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ABSTRACT: Defensible space (DS) theory proposes that the built environment can promote neighborhood safety and community by encouraging residents' appropriation of near-home space. This article examined the relationship between three different forms of resident appropriation and residents' experiences of neighborhood safety and community. Results from a survey of 91 public housing residents living in moderately defensible spaces suggested that residents who defended near-home space through territorial appropriation experienced the neighborhood as a safer, more cohesive community than did residents who did not appropriate space in this way. Residents who spent more time outside experienced the neighborhood as a safer place; however, casual social interaction in near-home space was not consistently related to outcomes. While no causal information is available from the correlational data presented here, this work takes an important step of providing empirical evidence of a systematic link between certain aspects of resident appropriation and positive outcomes. Implications for DS theory and for public housing policy are discussed.

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A fundamental goal of the U.S. Department of Housing and Urban Development (HUD) is to create safe, supportive communities. Recently, HUD (Cisneros, 1995) has focused attention on the role that the physical environment may have in achieving these goals through the creation of “defensible space” (Newman, 1973). Defensible Space (DS) interventions involve making physical changes to the areas around residences to make them less vulnerable to crime and more supportive of the development of community among residents. Millions of dollars have been invested in rehabilitating the physical environments of public housing and other residential neighborhoods in line with DS guidelines (Chenoweth, 1977; Cisneros, 1995; Hand, 1977; Hunter, 1978; HUD, 1998; Mayhew, 1979; Newman, 1996). Although some DS interventions have been successful, resulting in lower crime rates and more cohesive communities (Newman, 1996), success has not been consistent (Chenoweth, 1977; Cisneros, 1995; Hunter, 1978; Wilson, 1978). Little is known about additional factors that might promote the success of defensible space, particularly in distressed urban public housing neighborhoods in need of such interventions.

One factor that DS theory posits may be important in the success of defensible spaces is the extent to which residents defend and in other ways appropriate near-home space. If residents intervene when inappropriate or unsafe behaviors occur in near-home space, if they spend time there, if they interact with neighbors and participate in caretaking activities, DS theory asserts that community life should flourish, and safety should be maintained. If these types of physical, social, and territorial appropriation are inhibited, DS theory predicts that community life may be disrupted and that neighborhoods will become unsafe.

Given the current renewal of interest in DS design as an intervention with great promise for solving problems in public housing (Cisneros, 1995), and given that DS design is presumed to affect outcomes via resident appropriation, a careful scrutiny of what is known about appropriation within the unique context of public housing is warranted. Does residents’ defense of defensible space relate to greater levels of safety or community in public

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housing? Are other forms of appropriation, such as spending time outside, interacting with neighbors, or participating in the caretaking of a space, associated with these positive neighborhood outcomes? A review of empirical evidence suggests surprisingly little is known about residents' appropriation of defensible near-home spaces in public housing.

RESEARCH ON RESIDENT APPROPRIATION OF SPACE IN PUBLIC HOUSING

The relatively few studies that have addressed resident appropriation in public housing have been rooted in one of two research traditions: ethnographic descriptions of neighborhood life and quantitative studies testing DS theory. Ethnographic studies have provided intriguing illustrations of the importance of appropriation in public housing neighborhood life, exploring the physical and social context surrounding residents' appropriation of space. Several studies have described how community life in public housing developments centered on common spaces that supported social interaction (Beck & Teasdale, 1978; Conan, 1992; Cooper, 1975; Feldman & Stall, 1994). In a case study analysis of one notoriously unsafe housing development, Yancey (1971) concluded that the large-scale, anonymous physical design of common space in that development had inhibited residents' ability to appropriate near-home spaces, contributing to high levels of fear and crime. In another high-crime public housing neighborhood, Merry (1981) also found generally low levels of resident appropriation, although in those few places where residents were able to assert territorial control and watchfulness, residents felt safer, and criminals were reluctant to commit crimes. It is interesting that although this development was characterized by many DS features, appropriation appeared to be inhibited not by physical design, but by divisive social relations among resident ethnic groups. These ethnographic studies provide vivid demonstrations of—and exceptions to—the relationships predicted by DS theory, suggesting but not proving that resident appropriation may be an important factor for safety and community in neighborhoods.

Despite this intriguing ethnographic work, there have been few quantitative studies examining the direct relationship between resident appropriation and neighborhood safety and community outcomes in public housing. Instead, the idea that DS designs can help to create positive neighborhood outcomes by increasing levels of appropriation has generally been conceptualized as a mediated causal chain in which DS design is thought to increase levels of appropriation, which is in turn thought to lead to positive neighborhood outcomes. Physical design is posited as the “prime mover” of relation-

ships (Taylor, Gottfredson, & Brower, 1980), and much of DS research has consequently focused on establishing whether physical design affects outcomes, appropriation, or both. In answer to that question, research has generally found DS design to have positive but complex and inconsistent effects on appropriation and outcomes (Booth, 1981; Chenoweth, 1977; Coleman, 1987; Franck, 1978; Hand, 1977; Kohn, 1975; Mawby, 1977; McCarthy & Saegert, 1979; Newman, 1973; Skjaeveland & Gärling, 1997; for reviews, see Rubenstein, Murray, Motoyama, Rouse, & Titus, 1980; Taylor et al., 1980).

Within the context of a mediated model, the failure to document strong, consistent effects of DS design on appropriation or on outcomes suggests little reason to examine the subsequent link between appropriation and outcomes. However, research has linked appropriation of near-home space to positive outcomes in other types of urban and suburban neighborhoods, independent of DS design (Brown & Bentley, 1993; Perkins, Wandersman, Rich, & Taylor, 1993; Taylor et al., 1984; for a review, see Taylor, 1988). Thus, even if resident appropriation is not strongly affected by DS design, it may independently contribute to positive outcomes in at least some residential neighborhoods.

Is appropriation also related to positive outcomes in public housing? On one hand, the unique characteristics of public housing suggest that conclusions from studies of appropriation conducted in other contexts might not generalize to public housing (Rohe & Burby, 1988). For example, factors such as multifamily building design, persistent poverty, rentership rather than ownership, deteriorated housing stock, and high levels of crime might all plausibly reduce both the level at which residents are able to appropriate near-home spaces and the effectiveness of appropriation when it occurs.

On the other hand, two studies that have examined the effects of resident appropriation in public housing have provided some suggestion that appropriation may be linked to positive neighborhood outcomes, even in distressed public housing neighborhoods. At the individual level, Rohe and Burby (1988) found one index of territoriality, public housing residents' belief that their neighbors would be willing to intervene in problematic situations, related to residents' feelings of safety. At the aggregate development level, Newman and Franck (1980) found that public housing developments with higher average levels of appropriation were also characterized by lower average levels of fear and lower crime rates.

These studies provide some suggestion that appropriation may contribute to positive outcomes in public housing. However, these studies leave important aspects of DS theory untested. Although Rohe and Burby (1988) provide evidence of a relationship between one aspect of territoriality and

individuals' fear in public housing, they were primarily interested in investigating multiple predictors of fear of crime rather than focusing on appropriation of defensible spaces. Their study includes no information about physical design context, and only a single safety-related outcome (fear of crime) was examined. Although Newman and Franck (1980) conducted a comprehensive test of DS theory, they examined relationships only at the aggregate level across public housing neighborhoods and did not examine individual-level dynamics. As Taylor and his colleagues (1980) have pointed out, aggregate-level relationships cannot reveal the antecedents or consequences of residents' behavior within defensible spaces. In sum, whether residents' appropriation of defensible space is related to their experiences of neighborhood safety and community is an empirical question that has not been answered.

THE PRESENT STUDY

The central hypothesis of the present study was that the extent to which public housing residents defended and in other ways appropriated near-home defensible space would be linked to outcomes predicted by DS theory. Three types of space appropriation were examined: physical, social, and territorial appropriation. We were also interested in, in the words of Taylor and his colleagues (1980), potential antecedents of residents' behavior within defensible spaces. Although previous research suggests that age, length of residence, and family size are related to diverse aspects of residents' experiences of neighborhood life (Campbell & Lee, 1992; Coulton, Korbin, & Su, 1996; Covington & Taylor, 1991; Perkins & Taylor, 1996; Riger & Lavrakas, 1981; Rothenbuhler, 1991; Wandersman & Giamartino, 1980), little research has examined the influence of these variables on appropriation of near-home space, particularly in public housing (Rohe & Burby, 1988; Skjaeveland & Gärling, 1997). A secondary hypothesis of this study was, thus, that residents' background characteristics would be related to their appropriation of near-home space.

To test these hypotheses, structured interviews were conducted with 91 low-income, African American residents living in one public housing development. All buildings from which residents were sampled were characterized by moderate and essentially equal levels of defensible space. This research design permits an examination of the relationship between resident appropriation and safety and community outcomes, controlling for many physical design and socioeconomic factors.

METHOD

The data presented here are drawn from the Vital Inner-City Neighborhood Common Spaces archive, housed at the Human-Environment Research Laboratory, University of Illinois at Urbana-Champaign.

SITE

The research site was Chicago Public Housing's Ida B. Wells Homes. This site is a low-income, predominantly (97%) African American family public housing development consisting of 110 buildings in an eight-city-block area.

This site exhibits a moderate level of defensibility. All buildings at the site are multifamily housing buildings in either a row-house or walk-up design, and a single courtyard is shared by 18 families on average. Within this design, buildings and near-home spaces at the site conform to several defensible space guidelines. All buildings sampled were low-rise, ranging from one to four stories high. Surveillance opportunities are provided by windows at the front and back of each apartment. Building entrances lead either directly to a private apartment or to a staircase or hallway shared by a small number of apartments (two to eight). Outdoor open spaces are relatively small, clearly bounded by buildings or curbed streets, and clearly associated with particular buildings.

PARTICIPANTS AND PROCEDURE

Sampling was guided by two sets of constraints. First, households were selected such that the buildings sampled were representative of the development in architecture, size, orientation to the street, and vacancy rate. Second, sampling was restricted to residents who met certain eligibility criteria. Because families with young children tend to be the most intensive users of outdoor space, the sample was restricted to female heads of household with primary caretaking responsibility for at least one child less than 13 years old. To ensure that residents had lived in their apartments for at least one summer, the heaviest time of outdoor use, the sample was restricted to participants who had lived in their apartments during the previous summer.

Housing Authority records were used to randomly select a sample of target households fitting the above constraints. After informing targeted households about the study through letters and posted announcements, these households were approached on a door-to-door basis to invite participation.

If a targeted household declined participation, or if initial questions revealed that the household did not meet the eligibility criteria, an alternative household in the same building was selected and approached. To guard against oversampling of residents who spent more time at home (and who therefore might be especially likely to appropriate near-home open spaces), persistent efforts were made to contact targeted households (up to 10 return visits) before substituting an alternative household.

To enhance participation rates and interviewer rapport, all recruitment and interviewing were conducted by an African American female public housing resident. The interviewer had extensive experience in conducting structured interviews, did not reside in the housing development in this study, and had no prior familiarity with participants.

Of 142 residents approached, 26 (18.3%) declined participation; an additional 25 (17.6%) did not meet eligibility criteria. A total of 91 residents completed interviews; these residents were drawn from a total of 18 buildings, with two to six residents interviewed in each building. The composite participant profile was that of a 36-year-old single woman who had completed high school, was currently unemployed, and was receiving income assistance from Aid to Families With Dependent Children. She lived with her two children in an apartment she had lived in for several years.

All interviews were conducted in participants' apartments. Interview questions were read to participants, and participants selected answers from response scales printed on cards. Interviews lasted approximately 1 hour, and participants received \$10 for their time.

MEASURES

Extensive efforts were made to ensure that procedures and measures used in this study were appropriate for this cultural context. First, initial constructs and measures were refined through focus groups with residents. Second, two residents employed as members of the research team reviewed existing measures for appropriateness of language and content and assisted in the development of new measures. Third, resident feedback from pilot interviews was used to refine the wording of items and response scales. When possible, measures were selected that had been successfully used with low-income or minority populations and that had been found to have adequate reliability and validity in previous studies.

Interview measures assessed four sets of constructs: (a) three aspects of resident appropriation of near-home open spaces: physical, social, and territorial appropriation; (b) near-home safety; (c) community cohesiveness; and (d) demographics. Because some of the questions were on different metrics,

responses were standardized (using z scores) before subscale scores were constructed by averaging constituent item responses. Scale scores were constructed by averaging constituent subscale scores.

Physical, Social, and Territorial Appropriation. The extent to which participants appropriated near-home open spaces was assessed with 36 items in three scales: Physical Appropriation, Social Appropriation, and Territorial Appropriation. Because pilot interviews indicated that residents conceptualized near-home open spaces in terms of two spaces, front and back, items were organized into pairs, with the same question stem referring first to “the space in front of your building” and then to “the space in back.”

Physical Appropriation (four items developed from focus group interviews; $\alpha = .63$) assessed participants’ appropriation of near-home space through their physical presence in that space. One pair of items assessed the frequency of participants’ use of their near-home space “on a typical day during the summer,” using a Likert-type response scale from 0 = *never* to 5 = *several times a day*. The second pair assessed duration of typical use, from 0 = *only a few minutes* to 4 = *more than 3 hours*.¹

Social Appropriation (six items developed from focus group interviews; $\alpha = .69$) assessed appropriation of near-home space for social activities. Three pairs of items assessed how often residents greeted, chatted with, and spent time relaxing with others in near-home space, from 0 = *never* to 5 = *several times a day*.

Territorial Appropriation assessed a greater variety of behaviors and emotions through 26 items combined into one scale ($\alpha = .78$). Five pairs of items were adapted from Newman and Franck’s (1980) measure of local social control, shown to have acceptable reliability in previous use with residents of federally assisted public housing developments ($\alpha = .71$, Newman & Franck, 1982). These items assessed the likelihood, from 0 (*not at all likely*) to 4 (*very likely*), that participants or their neighbors would notice and intervene if destructive or illegal activities took place in near-home space (for example, if two 10-year-olds were spraying graffiti). Remaining items assessing this construct were developed from focus group interviews. Six pairs of items assessed caretaking of near-home space (for example, how much participants picked up trash), from 0 = *not at all* to 4 = *very much*; one pair assessed feelings of ownership over near-home space, from 0 = *not at all* to 4 = *very much*; and one pair assessed how often participants monitored activities in near-home space, from 0 = *never* to 5 = *several times a day*.

Appropriation variables were moderately but significantly correlated. Physical appropriation was significantly related to social appropriation

(Pearson's $r = .38, p < .001$) and to territorial appropriation ($r = .23, p < .05$); social appropriation was significantly related to territorial appropriation ($r = .31, p < .01$).

Near-Home Safety. The extent to which participants perceived near-home spaces as safe (near-home safety) was assessed with eight item pairs in three subscales: Feelings of Safety, Physical Incivilities, and Social Incivilities.

Feelings of Safety (four items; $\alpha = .87$) assessed how safe participants felt in near-home spaces in the front and the back of their building during the day and at night, from 0 = *not at all safe* to 4 = *very safe*. This measure displayed acceptable reliability ($\alpha = .79$, Normoyle & Lavrakas, 1984), and adequate evidence for validity (Bhana, 1995; Lavrakas, 1982; Taylor & Covington, 1993) in previous use with diverse populations.

Physical Incivilities and Social Incivilities (six items each; $\alpha = .78$ and $\alpha = .82$, respectively) assessed perceptions of minor physical and social transgressions in the near-home spaces in the front and the back of building. Items were adapted from scales developed by Perkins and colleagues (Perkins, n. d.; Perkins, Meeks, & Taylor, 1992). The original scales displayed adequate reliability ($\alpha = .88$ for physical incivilities, $\alpha = .89$ for social incivilities) (Perkins, Florin, Rich, Wandersman, & Chavis, 1990) and acceptable evidence for validity (Perkins et al., 1992, 1993; Perkins & Taylor, 1996) in previous use with low-income and minority urban residents. Physical Incivilities assessed levels of vandalism, graffiti, and trash in near-home space, and Social Incivilities assessed levels of noise, strangers, and illegal activity, from 0 = *not at all* to 4 = *very much*.

Near-Home Safety subscales were significantly correlated. Feeling Safe was significantly related to Physical Incivilities ($r = -.41, p < .001$) and to Social Incivilities ($r = -.32, p < .01$). Physical Incivilities were significantly related to Social Incivilities ($r = .74; p < .001$). Before constituent subscale scores were averaged to create the Near-Home Safety scale, items from the Physical and Social Incivilities subscales were reverse coded to allow higher scores to indicate greater levels of safety. The alpha coefficient for the overall Near-Home Safety scale was .88.

Community Cohesiveness. The extent to which participants perceived their neighborhood as a cohesive community (community cohesiveness) was assessed with 20 items in three subscales: Neighboring Relationships, Sense of Community, and Local Involvement. Community Cohesiveness subscales and items are presented in Table 1.

Neighboring Relationships (15 items; $\alpha = .76$) assessed the proportion of nearby neighbors with whom participants shared friendly neighboring

TABLE 1
Community Cohesiveness Subscales and Items

<i>Subscale</i>	<i>Response Scale</i>
Neighboring Relationships (15 items) ^a	
How many of the residents who live in THIS building [in the building in the FRONT/ in the building in the BACK] can you recognize?	0 (<i>none</i>) to 4 (<i>all</i>)
How many residents here [there] do you know the names of?	0 (<i>none</i>) to 4 (<i>all</i>)
How many residents here [there] do you socialize with casually?	0 (<i>none</i>) to 4 (<i>all</i>)
How many residents here [there] have you borrowed or exchanged something with?	0 (<i>none</i>) to 4 (<i>all</i>)
How many residents here [there] have you asked to watch your children for a few minutes, for example while you ran to the store?	0 (<i>none</i>) to 4 (<i>all</i>)
Sense of Community (9 items)	
How much would you say that you have a sense of belonging with the people on this block?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How much would you say that the friendships and associations you have with other people on this block mean a lot to you?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How much would you say that a feeling of fellowship runs deep between you and other people on this block?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How much would you say that you agree with most people on this block about what is important in life?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How much would you say that you feel loyal to the people on this block?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How much would you say that you would be willing to work together with others on something to improve something about this block?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How much would you say that you like to think of yourself as similar to the people who live on this block?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How much would you say that, if the people on this block were planning something, you'd think of it as something "we" were doing <i>together</i> , rather than something "they" were doing?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How much would you say that you get a sense of community from living on this block?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
Community Involvement (6 items)	
How much do you keep up with what's happening in your neighborhood, by keeping up with the gossip, going to meetings, stuff like that?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How much do you think about how to improve things in your neighborhood?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How much do you get together with people who know what is going on in your neighborhood?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How much do you get involved in bringing about a change into your neighborhood?	0 (<i>not at all</i>) to 4 (<i>very much</i>)
How often do you get together with people to work for the tenant council or some resident organization (tenant patrol, meetings)?	0 (<i>never</i>) to 5 (<i>several times a day</i>)
How often do you participate in a church activity?	0 (<i>never</i>) to 5 (<i>several times a day</i>)

a. For the Neighboring Relationships subscale, each of five questions was repeated three times, first in reference to the participant's own building, next in reference to the building adjacent in the front, and finally in reference to the building adjacent in the back.

relationships. Subscale items were adapted from measures developed by Unger and Wandersman (1982) and Perkins et al. (1990), who found the original measures to have acceptable reliability ($\alpha = .76$, Perkins et al.; $\alpha = .88$, Unger & Wandersman) and adequate evidence for validity. Items were adapted to assess relationships with neighbors in (a) participants' own buildings, (b) buildings immediately adjacent in front, and (c) buildings immediately adjacent in back. These items assessed, for example, what proportion of residents in each building participants shared small favors with, from 0 = *none* to 4 = *almost all*.

Sense of Community (nine items; $\alpha = .88$) assessed participants' feelings that the neighborhood they lived in gave them a sense of community. Items were adapted from the Psychological Sense of Community subscale of Buckner's (1988) Neighborhood Cohesiveness Scale. In previous use with diverse populations, the original full scale displayed acceptable reliability ($\alpha = .91$, Robinson & Wilkinson, 1995; $\alpha = .95$, Buckner) and adequate evidence for validity (Buckner; Robinson & Wilkinson). Items on the subscale used here assessed, for example, how similar participants felt to other residents on the block, from 0 = *not at all* to 4 = *very much*.

Local Involvement (six items; $\alpha = .72$) assessed the extent to which residents were involved in the neighborhood community. Four subscale items were taken from Rothenbuhler's (1991) Community Involvement Scale, shown in previous work to have acceptable Guttman-scale reliability (coefficient of reproducibility = .94; Rothenbuhler). These items assessed, for example, how much participants kept up with what happened in the neighborhood, from 0 = *not at all* to 4 = *very much*. Two additional items developed from focus group discussions assessed how often participants spent time working for the tenant council or other neighborhood organizations and how often they participated in church activities, from 0 = *never* to 5 = *several times a day*.

Community Cohesiveness subscales were significantly correlated. Neighboring Relationships were significantly related to Sense of Community ($r = .39, p < .001$) and to Local Involvement ($r = .50; p < .01$). Sense of Community was significantly related to Local Involvement ($r = .50; p < .001$). The alpha coefficient for the overall Community Cohesiveness scale was .88.

Demographic variables. Each participant provided basic demographic information, including year of birth, used to compute age ($M = 35.6, SD = 11.3$, range: from 19 to 70 years); number of children younger than 18 living in the household ($M = 2.7, SD = 1.2$; range: from 1 to 6 children); and the date each participant moved into her apartment, used to compute residential

tenure ($M = 10.0$, $SD = 9.0$, range: from 10 months to 45 years). Age was significantly correlated with number of children ($r = .32$, $p < .01$) and with tenure ($r = .45$; $p < .001$); the relationship between tenure and number of children was not significant ($r = .13$; $p = ns$).

LEVELS OF ANALYSIS

A generalizability theory approach was used to assess whether building-level differences should be modeled in analyses (Fyans, 1983; O'Brien, 1990). A preliminary examination revealed that most variables obtained negative generalizability coefficients, resulting from substantially greater variation on these variables within than between buildings. It may be that participants' perceptions and experiences of these constructs are not consistent at the building level (in other words, that building-level differences do not exist), or it may be that consensus exists but was not reliably assessed using these measures, this research design, or this sample size. Regardless, for these variables within this sample, variance components at the building level were insufficient to warrant the inclusion of building-level differences in further analyses. All analyses were therefore conducted at the individual level.

RESULTS

The two hypotheses addressed in this study were (a) that residents' appropriation of near-home spaces would be related to residents' experiences of greater safety and community cohesiveness in the local neighborhood and (b) that demographic characteristics of participants would predict the levels at which they appropriated moderately defensible near-home spaces. The data analysis proceeded in two stages, first examining demographic predictors of both appropriation and outcomes, then testing relationships between appropriation and outcomes.

DEMOGRAPHIC VARIABLES AS PREDICTORS OF APPROPRIATION AND OUTCOMES

If, as hypothesized, demographic characteristics of participants were related to residents' experiences and perceptions of neighborhood life, then demographic variables should be correlated with appropriation and outcome variables. To test this hypothesis, the first set of analyses computed correlations of demographic variables—age, tenure, and number of children—to

TABLE 2
Correlations Between Demographic Variables and Resident
Appropriation, Near-Home Safety, and Community Cohesiveness Scales
and Subscales (N = 91)

<i>Variable</i>	<i>Age</i>	<i>Tenure</i>	<i>Number of Children</i>
Physical Appropriation	-.01	-.04	.04
Social Appropriation	.20	.09	.14
Territorial Appropriation	.32**	.32**	.04
Near-Home Safety	-.07	.00	-.11
Feelings of Safety	-.17	-.15	-.09
Physical Incivilities	.01	-.07	.05
Social Incivilities	-.04	-.11	.15
Community Cohesiveness	.47***	.24*	.24*
Neighbor Relations	.36**	.24*	.26*
Sense of Community	.34**	.15	.18
Community Involvement	.41***	.19	.13

* $p < .05$. ** $p < .01$. *** $p < .001$.

appropriation and outcome variables. Zero-order correlations are displayed in Table 2.

One form of appropriation, territorial appropriation, was significantly correlated with age and tenure. All community cohesiveness variables were significantly correlated with age, and the Neighboring Relationships subscale was also significantly correlated with tenure and number of children.

Analyses further examined whether demographic variables retained univariate significance when joint effects were considered in a multivariate framework. Multivariate regression analyses were used to predict appropriation and outcome variables from age, tenure, and number of children. Results, displayed in Table 3, indicated that age remained the only significant predictor.

RELATIONSHIPS OF APPROPRIATION VARIABLES TO SAFETY AND COMMUNITY OUTCOMES

The second hypothesis of this study was that appropriation would be related to residents' experiences of safety and community in the local neighborhood. Two possibilities were examined. First, simple linear relationships between appropriation and outcomes were examined with correlational analyses. Second, because age was an important covariate of certain appropriation and outcome variables, age was added as a covariate in multivariate analyses examining the relationships of appropriation to outcome variables.

TABLE 3
Summary of Multiple Regression Analyses Predicting Resident
Appropriation, Near-Home Safety, and Community Cohesiveness
With Demographic Variables (N = 91)

<i>Dependent Variables</i>	<i>Standardized Regression Coefficients of Predictor Variables</i>			
	<i>Adjusted R²</i>	<i>Age (β)</i>	<i>Tenure (β)</i>	<i>Number of Children (β)</i>
Physical Appropriation	-.03	.00	-.04	.05
Social Appropriation	.01	.17	.00	.08
Territorial Appropriation	.12**	.25*	.21	-.07
Near-Home Safety	-.02	-.05	.03	-.10
Feelings of Safety	.00	-.11	-.10	-.04
Physical Incivilities	-.03	.04	-.09	.04
Social Incivilities	.01	-.04	-.11	.18
Community Cohesiveness	.21***	.43***	.03	.10
Neighbor Relations	.13**	.26*	.10	.17
Sense of Community	.09**	.32**	.00	.08
Community Involvement	.14**	.41**	.00	.00

* $p < .05$. ** $p < .01$. *** $p < .001$.

In these analyses, the relationships of three aspects of appropriation (physical, social, and territorial appropriation) to two outcome variables (near-home safety and community cohesiveness) were examined.

Simple linear relationships. If as hypothesized, appropriation of near-home spaces is related to residents' experiences of safety and community in the neighborhood, then simple linear relationships between these could be expected. To test this possibility, analyses examined the zero-order correlations between appropriation and outcome variables.

On the whole, zero-order correlations displayed in Table 4 indicated that participants who reported more appropriation of near-home defensible spaces also reported more positive experiences of safety and community in the nearby neighborhood. For safety-related outcomes, although there was no relationship between social appropriation and any of the near-home safety variables, results indicate that participants who engaged in more physical appropriation reported fewer physical and social incivilities, whereas those who engaged in more territorial appropriation reported fewer social incivilities.

For community-related outcomes, although there was no relationship between physical appropriation and any of the community cohesiveness variables, results indicate that participants who reported engaging in more social

TABLE 4
Correlations Between Resident Appropriation Variables and Near-Home Safety and Community Cohesiveness Scales (N = 91)

Dependent Variables	Appropriation Variables		
	Physical	Social	Territorial
Near-Home Safety	.27**	-.04	.23*
Feelings of Safety	.20	.00	.13
Physical Incivilities	-.25*	.03	-.19
Social Incivilities	-.22*	.09	-.24*
Community Cohesiveness	.14	.25*	.50***
Neighbor Relations	.06	.21*	.27*
Sense of Community	.17	.24*	.49***
Community Involvement	.07	.13	.37***

* $p < .05$. ** $p < .01$. *** $p < .001$.

appropriation reported stronger neighboring relationships and a greater sense of community. Those who engaged in territorial appropriation reported stronger neighboring relationships, greater sense of community, and more local involvement.

Multivariate linear relationships. Given that age was related to territorial appropriation and to community cohesiveness, the possibility arose that the relationship between territorial appropriation and community outcomes demonstrated in correlational analyses may reflect a spurious relationship, explained by age. To rule out this possibility, age was included as a covariate in remaining analyses. Further, to limit the occurrence of chance results caused by multiple tests of significance, and to facilitate comparison among results, Near-Home Safety and Community Cohesiveness scales replaced constituent subscales in use as dependent variables for these analyses. Specifically, hierarchical multiple regression was used to predict near-home safety and community cohesiveness, with age added as a predictor in Block 1 and physical, social, and territorial appropriation added as predictors in Block 2. These analyses also revealed whether individual forms of appropriation retained univariate significance when joint effects were considered in a multivariate framework.

Table 5 displays these regression results. For near-home safety, consistent with simple correlational results, age did not contribute to the explanation of variance in the first stage of the regression model. When the second regression block including physical, social, and territorial appropriation was added, a significant change in R^2 indicated that these variables jointly added a significant amount of explanatory power. Physical appropriation and territorial

TABLE 5
Summary of Hierarchical Multiple Regression Analyses Predicting Near-Home Safety and Community Cohesiveness (N = 91)

<i>Model</i>	<i>Adjusted R²</i>	<i>R² Δ</i>	<i>β</i>
Model 1: Near-Home Safety	.12**		
Step 1		.00	
Age			-.07
Step 2		.15**	
Physical Appropriation			.30**
Social Appropriation			-.22
Territorial Appropriation			.26*
Model 2: Community Cohesiveness	.33***		
Step 1		.22***	
Age			.47***
Step 2		.14**	
Physical Appropriation			.03
Social Appropriation			.06
Territorial Appropriation			.36***

* $p < .05$. ** $p < .01$. *** $p < .001$.

appropriation each contributed significant explanatory power at the univariate level, above and beyond the effects of other variables in the model.

For community cohesiveness, age explained a significant amount of variance in the first stage of the regression model. Controlling for the effects of age, the second regression block including physical, social, and territorial appropriation resulted in a significant change in R^2 , indicating that these variables jointly added significant explanatory power. Territorial appropriation contributed a significant amount of explanatory power at the univariate level, above and beyond the effects of other variables in the model. Thus, this form of appropriation appeared to reliably predict residents' experiences of safety and community outcomes, even after controlling for correlated variables.

DISCUSSION

The major goal of this study was to examine whether the extent to which residents defend and in other ways appropriate near-home space was related to outcomes predicted by DS theory. Consistent with hypotheses, public housing residents who defended near-home space through territorial appropriation experienced the neighborhood as a safer place and as a more cohesive community than did residents who did not appropriate space in this way.

Although social appropriation was not consistently related to outcomes, residents who engaged in more physical appropriation experienced the neighborhood as a safer place but not as a more cohesive community. Additional findings indicated that residents appropriated defensible spaces around their homes to a different extent, depending in part on their demographic characteristics. These findings are discussed in turn, and the article ends with a discussion of limitations of this work and directions for future research.

LINKS BETWEEN APPROPRIATION OF SPACE AND EXPERIENCES OF SAFETY AND COMMUNITY

Whereas previous research in other contexts had suggested that resident appropriation may be related to levels of neighborhood safety and community, research in public housing had examined only isolated aspects of these relationships. Work by Yancey (1971) and Merry (1981) provided case study illustrations of public housing neighborhoods characterized both by low levels of appropriation and high levels of crime and fear, without establishing systematic links among these constructs. Research by Newman and Franck (1980, 1982) demonstrated that public housing developments characterized by higher average levels of appropriation were likely to have lower average levels of crime and fear, but this research revealed little about individual-level dynamics. In addition, research by Rohe and Burby (1988) linked a single aspect of appropriation specifically to residents' fear of crime in public housing but provided no information about whether participants lived in defensible or indefensible spaces. Thus, none of these studies examined how diverse aspects of residents' appropriation of defensible space might be related to their experiences of neighborhood safety and community, the central focus of this study.

Results presented here suggest that public housing residents who defended near-home space through territorial appropriation experienced the neighborhood as a safer, more cohesive community than did residents who did not appropriate space in this way. One interpretation of these findings is that when residents exert territorial control over near-home spaces in public housing, those near-home spaces may become safer and more likely to support cohesive relationships among neighbors. A second possibility is that the causal order is in the opposite direction: that neighbors who feel safer, or who are confident in strong community ties, may in consequence engage in more territorial appropriation. These interpretations may not be mutually exclusive: A third possibility is that territoriality and positive outcomes each reinforce the other. For example, territoriality may help to build social relationships by providing an arena of mutual interest and concern, and these

stronger, more cohesive social ties may further strengthen individuals' willingness to exert territorial control (Greenberg & Rohe, 1986). It is also possible that residents who feel at least a minimal level of safety may be willing to engage in territorial behaviors that further increase levels of safety. Results presented here are consistent with previous research and theory suggesting links between territoriality and positive neighborhood outcomes in other neighborhood contexts (Greenberg, Rohe, & Williams, 1981; Taylor, 1988; Taylor & Hale, 1986) and extend this previous work by providing evidence for these relationships in a public housing context. In addition, although no information is available from these data about the causal direction of these relationships, these results are at least consistent with DS theory's assertion that territorial appropriation might contribute to positive neighborhood outcomes in public housing.

A second set of findings suggests that residents who reported greater physical appropriation of near-home space (i.e., spent greater amounts of time outside) experienced the neighborhood as a safer place, although not as a more cohesive community. Specifically, residents who spent more time outside reported fewer physical and social transgressions there. These relationships were obtained despite the plausible expectation that individuals who spend more time outside might have greater exposure to, and thus awareness of, incivilities in the near-home environment. One interpretation of these results is that residents spend time outside in near-home spaces only if they feel that the local environment is civil and safe. However, a second interpretation is that the mere presence of residents in a space may actually discourage destructive or inappropriate behavior. Although these results do not provide information about potential causal relationships, they are consistent with DS theory's predictions that residents' use of defensible space might contribute to greater safety. These results do not, however, provide support for a link between use and community cohesiveness.

Contrary to hypotheses derived from DS theory, in this study, social appropriation was not consistently related to outcomes. Once an important demographic variable, age, and other forms of appropriation were accounted for, social appropriation displayed no significant relationship to safety or community outcomes. This pattern provides some suggestion that engaging in casual social interaction in near-home spaces, in and of itself, may not be related to residents' experiences of positive neighborhood outcomes. These counter-theoretical findings may be due to a statistical artifact resulting from high intercorrelation among appropriation variables. On the other hand, these findings are consistent with previous empirical findings by Becker (1977) and by Franck (1978).² The findings may also be consistent with Jarrett's (1997) description of withdrawal from casual neighboring relationships as an

important coping strategy for families who perceive their neighborhoods as threatening, disorganized, or unpredictable. If public housing residents rely primarily on well-established, trusted social ties, it seems reasonable to expect that casual social interaction in the neighborhood might not be linked to strong feelings of community (see also Brodsky, 1996; Feldman & Stall, 1994; Stack, 1974). There currently is a great deal of policy interest in using defensible space as a means to strengthen community in public housing neighborhoods, and DS theory suggests that this impact would rely on critical mediating processes such as casual social interaction. Yet, this study and others appear to suggest casual social interaction may not be sufficient to ensure strong community outcomes in distressed public housing neighborhoods. Future research should explore exactly what role casual social interaction may play in the formation of community ties within different neighborhood contexts and whether other factors may also be necessary to promote successful community building.

For those aspects of appropriation that were related to outcomes, is it the case that appropriation of near-home space can lead to a safer, more cohesive public housing environment? There are good theoretical reasons to think so, and these results are consistent with that hypothesis. Longitudinal, multilevel research is needed to examine possible causal relationships over time. By providing systematic empirical evidence linking certain appropriation behaviors with residents' experiences of neighborhood outcomes, these findings provide an important first step in establishing these relationships.

DEMOGRAPHIC PREDICTORS OF RESIDENT APPROPRIATION

A secondary focus of this study was examining whether residents' background characteristics were related to the extent to which they appropriated near-home space. Previous research had linked demographic characteristics such as age, family size, and length of residence to residents' experiences in local neighborhoods (Campbell & Lee, 1992; Coulton et al., 1996; Covington & Taylor, 1991; Perkins & Taylor, 1996; Riger & Lavrakas, 1981; Rothenbuhler, 1991; Wandersman & Giamartino, 1980), but relatively little research has examined these relationships in public housing (Rohe & Burby, 1988; Skjaeveland & Gärling, 1997). In addition, research on DS theory has largely overlooked the role of individual differences.

In this study, older, established residents reported more territorial appropriation of near-home spaces. Older, established residents, and those with more children, also reported stronger neighboring relationships, whereas older residents reported a greater sense of community and more involvement in community organizations and activities.

One interpretation of these findings arose from informal conversations with older residents, who often shared stories about how the neighborhood was different when they were young and how the culture of this public housing development had changed over recent decades. These discussions suggest that younger residents may be different from older residents in part due to cohort differences arising from neighborhood cultural change. Such a shift in culture may reflect a larger trend in urban American culture described by sociologists as moving away from communities of place to communities of interest (Kasarda & Janowitz, 1974; Wellman & Leighton, 1979). Cohort differences may thus exist because older, established residents were socialized into a cohesive, involved neighborhood culture less available to younger residents. Alternately, cohort differences may reflect younger residents' withdrawal from a neighborhood youth culture increasingly dominated by gang violence and drug trade. Older residents' participation in the neighborhood would presumably be less affected by these trends, because their social relationships would be with their own peers and not rooted in youth culture.

Yet another interpretation of the relationship of age to territoriality and community cohesiveness is that, as suggested by Riger and Lavrakas (1981), people's stage in the life cycle may affect their attachment to the local community. Older residents may merely be at a point in their lives where they have more time and inclination to contribute to the community than younger residents have. This latter interpretation would certainly be consistent with an Eriksonian life course view of the age span, in which later stages in the life cycle are characterized by an increasing concern for generativity. To provide further insight into the role of individual differences in participation in community life, future research should adopt a historically sensitive, life span approach to investigating the ways in which residents become involved in their neighborhoods.

LIMITATIONS AND FUTURE RESEARCH

One limitation to this study is that these results are based only on self-report data. Method bias may have inflated the strength of relationships between constructs or produced spurious relationships. For example, certain participants may have been motivated to present globally positive or negative descriptions of all aspects of neighborhood life, resulting in a halo effect and spurious relationships between constructs. However, it is important to note that the use of self-report provides a unique lens into understanding individuals' experiences of and contributions to neighborhood life. Future research should combine both self-report and objective ratings to obtain richer views

of neighborhood life (for two notable examples, see Perkins & Taylor, 1996, and Korbin & Coulton, 1997).

A second limitation is the cross-sectional correlational nature of the research design. Absent any information about causal direction of these relationships, it seems plausible that residents' appropriation of near-home space is simply a function of existing levels of community and safety in the neighborhood. However, there are also strong reasons to suggest that these relationships may be more complex. For example, Wilson and Kelling's (1982) broken windows theory suggests how residents' participation in neighborhood life may be linked to the deterioration of the physical environment of the neighborhood in a reinforcing cycle. In this process, cues in the physical environment are thought to increase residents' fear, fear leads residents to withdraw from neighborhood life, and withdrawal leads in turn to further deterioration of the neighborhood. Relationships demonstrated here—that residents who engage in less appropriation of near-home neighborhood space perceive more incivilities—may provide a hint that the cycle proposed by Wilson and Kelling may pertain in public housing neighborhoods. Future research should employ longitudinal designs to explore the potential causal order underlying the relationships among appropriation and outcome variables. A critical issue from a policy perspective is whether intervening in a positive direction could help to reverse such a spiral.

A third limitation is that these findings pertain only to the individual, but not to the aggregate, level of analysis. In other words, although these results suggest that individuals who more extensively appropriate near-home space experience greater levels of neighborhood safety and community, these findings do not address whether buildings that are appropriated to a greater extent by residents living there have greater levels of safety or more cohesive neighbor groups. However, individual-level relationships remain important for several reasons. First, changes in individuals' behaviors may be a necessary starting point for broader change at the street block or neighborhood level. Second, individuals' behaviors may be especially important in neighborhoods that experience high levels of tenant turnover, where stability in neighbor composition may not be sufficient to sustain group cohesion and collective forms of social control. Third, if individuals vary in their responses to the built environment, accounting for where this variability arises from and understanding associated outcomes can contribute to a better understanding of how environments influence behavior. Future research could employ techniques such as hierarchical linear modeling to examine both individual and aggregate level factors that contribute to neighborhood safety and community.

A fourth limitation is that this study investigated the effects of appropriation under only one type of defensible space design, a moderately defensible design. Given that variation in the defensibility of spaces was essentially held constant in this study, any effects that defensibility of near-home spaces may have had on outcomes would have remained hidden in this study. The possibility remains that DS design and appropriation may each contribute independently to outcomes (a main effect) or that appropriation behaviors may be more effective within DS designs (a moderated effect). Alternately, these environment-behavior relationships may best be characterized in terms of affordances³ (Evans & McCoy, 1998; Gibson, 1986; Greeno, 1994; Zaff, 1995). These alternative models can only be investigated using research designs in which levels of both appropriation and DS design vary. Future research should examine near-home spaces with different levels of defensibility to test whether certain residents are more likely to appropriate certain spaces and whether the effectiveness of appropriation is conditioned by physical design.

POLICY IMPLICATIONS

The conceptual and empirical links presented in this work may have important implications for policy and practice in public housing. Previous conceptual models of a simple, direct relationship between physical design and behavior may underestimate factors in addition to physical design that might influence residents' ability and willingness to appropriate near-home space (McCarthy & Saegert, 1979; Wilson, 1978). It may be fruitful to consider policies in addition to modification of the physical environment that may encourage resident appropriation. One important strategy may be to include residents in the design, planning, and management of the physical environment, a principle emphasized in Newman's later writings (Newman, 1996; see also Heinzlmann, 1981; Jeffrey, 1971).

A second strategy may be to identify specific policies that might foster residents' appropriation of near-home space in public housing. At a minimum, restrictive policies that limit residents' ability to personalize the space around their homes could be lifted. In addition, simple modifications could be made to existing near-home settings, such as adding play equipment within monitoring distance of apartments or providing benches and shade to make spaces more comfortable. An additional strategy could be to provide residents with equipment and supplies that encourage gardening or decoration of near-home spaces. Although these efforts cannot replace the significant investments in infrastructure, maintenance, and policing that are

urgently needed in many public housing developments, they are small-scale, manageable efforts that could provide important "small wins" (Weick, 1984) for tenant councils and other resident-based organizations.

CONCLUSION

Results presented here extend previous research by providing evidence within a public housing context in support of an important relationship posited by DS theory. Specifically, the results suggest that public housing residents' defense of space through territorial appropriation is systematically related to their experiences of safety and community in the neighborhood and that residents' physical appropriation of near-home space is systematically related to experiences of safety. Further findings suggest that, within essentially equally defensible spaces, residents varied in the extent to which they appropriated near-home space, and this variability was to some extent predicted by their background characteristics. Although this study is based on correlational data, and no causal inferences can be drawn, this work takes an initial step of suggesting links between certain aspects of residents' appropriation of near-home spaces and positive neighborhood outcomes. Future work should examine whether, as predicted by DS theory, these aspects of residents' appropriation of near-home space might actually contribute to addressing the serious problems of crime and disintegration of community in public housing.

NOTES

1. Both item content and resident input were considered in developing item response scales. Different point scales were used where appropriate to capture the response categories judged to be most suitable for each item.

2. Becker (1977) found that a large number of acquaintanceships in a public housing development did not predict greater feelings of safety. Franck (1978) found that public housing residents with more casual acquaintanceships in the neighborhood perceived less safety, although residents with more close friendships in the neighborhood perceived greater safety.

3. An affordance model might offer the additional advantage of providing a framework to understand the previously unexplored role of individual differences in defensible space relationships. Specifically, in places where the physical environment provides few opportunities for residents' appropriation of space, as would be expected under conditions of low defensibility, individual differences might be expected to have little influence on the occurrence of appropriation behavior. Having few affordances would restrict behavior equally for all individuals,

regardless of how individual differences might otherwise impact behavior. However, where the environment does provide affordances for behavior (such as may be the case with the moderately defensible spaces in this study), it seems plausible to expect that some individuals will take advantage of those opportunities whereas others will not. Thus, individual differences should play a small role in explaining behavior in spaces with low defensibility and yet may play a much larger role in explaining behavior in spaces with greater defensibility.

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