Community Health And Urban Residential Lot Study
Hixon Center for Urban Ecology Fellowship Report

Alexis Dinno
MPH, MEM

Abstract

We tested the effect of Urban Resources Initiative summer greenspace projects on both environmental expression of social norms of land use in residential abandoned lots and on the emotionality, violence perceptions and safety-related behavior of New Haven residents in August of 2000. URI greenspace projects were found to increase the vibrancy of social use of abandoned parcels in New Haven. At the same time, URI greenspace projects were found significantly associated with increased positive emotionality, decreased negative emotionality and increased perceptions of violence against others in the neighborhood. No significant association was found between safety-related hesitation or reported violence outside and URI greenspace projects. This study provides an assessment of the reliability and validity of the Environmental Expression on Abandoned Lots Scale.

Introduction

New Haven, CT is a city rife with residential abandonment. According to 1990 Census data and population projections based upon that data, in 2000, New Haven has a population of between 120,000–130,000 residents, yet the existing housing units can support 150,000. In the poorer communities, vacancy often translates into abandoned properties, including those structures which are boarded up, torched, vandalized, wrecked or thoroughly demolished. In the wake of the socio-economic forces driving abandonment, communities become hosts to private or city government-reclaimed properties absent care, investment or established social role. In this vacuum of fulfilled norms, abandoned residential lots become at once at liability and an opportunity for the occupants of the block on which they are located. Depending on the availability of social resources the "natural ecology" or "life course" of such property parcels can vary widely, from a makeshift children's playground amid cast-off furniture, needles and automobiles, to spaces so overgrown with vegetation that the existence of any still standing structures within is a matter of speculation, to vegetable patches, to vibrant, park-like centers of community activity. Within this setting, community residents live out their daily lives, grapple with making ends meet, raising families and often attempt to create a sense of belonging. Many struggle to cope with violence, public prostitution or drug use within their neighborhoods. Some of this daily life plays out in forming social groups such as children's safe houses, gardening groups or neighborhood block watch organizations. The Urban Resources Initiative (URI) is a New Haven non-profit land stewardship, environmental education and urban community forestry organization that dedicates a significant portion of its efforts to yearly, community greenspace projects on abandoned lots and streetscapes. Modeled on participatory rural appraisal methods, URI is approached by neighborhood organizations each fall to engage these projects for the

following Spring/Summer cycle. While varying from site to site, and from year to year, each project incorporates several factors including: social outreach to residents by key residential contracts during the spring; invested responsibility for the project in a single community forestry intern who works closely with residents, bringing landscape design expertise and appraisal skills into a community dialogue concerning vision for the neighborhood; labor coordination and project scheduling; and material assistance including landscape design supplies (compost, perennials, trees, construction material), transport and hauling.

Aims

The principle aims of the Community Health and Urban Residential Lot Study (CHAURLS) are to test the hypothesized effects of community-based urban residential restoration projects in New Haven, Connecticut upon both social use of abandoned lots in the residential landscape and psychosocial measures of health and well being. during the summer of 2000. This quasi-experimental, observational study emphasizes use-related factors of the physical environment, especially along those dimensions bounded temporally and spatially by the abandoned residential lot. At the same time, health is examined in aspects of perceived-safety, safety-related behavior and self-perceived positive and negative affect. The results of this study will inform further research, and provide indications for effective health promotion.

Hypotheses

URI summer greenspace projects are hypothesized to increase the environmental expression of social norms on residential abandoned lots. URI-related abandoned lot restoration and greenspace programs, degree of residential property abandonment, proximity to abandoned

parcels and the character of abandoned residential lots are hypothesized to reduce self-perceived negative affect among residents; increase self-perceived positive affect; decrease self-reported safety-related behavior (hesitation to use outdoor neighborhood space); and decrease self-reported violence within a neighborhood.

Background

The evidence supporting these hypothesized relationships within New Haven is largely anecdotal and qualitative: relying on interviews with residents, URI staff and members of city agencies. (Dinno, 2000) While the wider scientific literature is currently young, green and growing, there is support for the relationships hypothesized in CHAURLS. Criminological research during the 1960s produced "Broken Windows Theory" (BWT) which explains social disorder (public drunkenness and other drug use, prostitution, incivility and vandalism and violence, etc.) in residential neighborhoods as a function of explicit and implicit cues in the physical environment. Social disorder is discussed in BWT and subsequent criminological literature as pertaining in part to perceptions of neighborhood violence and safety. (Wilson and Kelling, 1982; Rohe, 1988) Recent health research employs broken window measures as predictors of gonorrhea. (Bachmann, et al., 2000; Gunn, et al., 2000) A current wealth of social research in the tradition of the Chicago school of urban sociology relates the condition of neighborhood spaces to social (social cohesion, rich qualitative descriptions of peer and intergenerational outdoor interaction, etc.) and individual (attention deficit disorder, perceived safety, personal neighborhood preference, etc.) indicators of health and well-being—particularly among the urban poor. (Kuo et al., 1998; Taylor, et al. 1998, 2001) Current social and community psychology (including ecopsychology) research and practice emphasizes the role of

daily environments—especially elements of greenery in the outdoor landscape—as critical contributors to psychosocial stress and childhood development. (Taylor, et al., 1997; Kuo, et al. 1998; Roszak et al. 1995) This psychological literature draws upon the biophilia hypothesis which asserts that humans have an evolved biological and developmental need for natural setting and contact with less-disturbed ecosystems (Kellert, 1997; Wilson, 2001). Finally, recent and ongoing sociological study refines and expands BWT so that the environment is not only viewed as a *determinant* of social disorder and individual human experience, but as an interdependent consequence of the same, mediated by the collective efficacy of a community. (Sampson and Raudenbush, 1999) CHAURLS attempts to apply such environmentally and ecologically oriented perspectives explicitly to public health research and action.[1]

Methods

Population Selection, Clustering and Sampling Strategies

The study employed a cross-sectional, multi-level study design to order observation of the relationships between residential block-level environmental qualities, and individual-level perceptions of safety, self reported safety-related behavior and emotional response, and URI summer 2000 project status. Dual units of observation are featured in the strategy of this study: the individual resident and the individual abandoned lot.

Hierarchal clusters are defined as residential blocks containing only residential parcels and (if present) parcels affiliated with religious organizations. Of the 13 residential blocks hosting URI summer 2000 greenspace projects and meeting the above restrictions, 7 were chosen

---

[1] The growing literature surrounding the practice and study of "healing gardens" within an explicit health-care provision context is not addressed here. See Frumkin (2001) for further reference.

for using random selection without replacement (the number of sites selected was a function of resource allocation). In addition, for each such block chosen, an adjacent block also meeting the above criteria was selected randomly without replacement from the blocks adjacent to each intervention block. A single residential block parallel to the one with a URI summer 2000 project was chosen from the one or two nearest parallel blocks. Some project sites did not have any adjacent or parallel blocks that met the criteria for inclusion in the set of assessed blocks. The residential blocks in this study are also referred to as sites. Clustering of the two contextual environmental attributes occurs on block sites containing URI projects, and those with no URI project.

Each parcel on every block in the study was assessed on August 1st, 2000 using the Lot Abandonment Assessment Tool described in the section on measurement below. On each study site every abandoned lot designated by this tool was assessed using the Environmental Expression in Abandoned Lots Scale (EEALS) instrument also described below. On July 31st, 2000, each occupied residential address was hand-delivered a single survey questionnaire including consent, instructions and a self-addressed stamped envelope for return. Occupancy was assessed by visual cues and neighbor-provided information. The substantive portion of the survey was divided into four sections. The first section contained several basic demographic variables including gender, date of birth, address (used to produce the average distance to abandoned parcel score and identify the respondent's cluster site), and whether someone in the respondent's household owns the property. The second section contains a series of questions pertaining to affective response to the block. The third and fourth sections contain questions about violence and hesitation-related behavior respectively (see below). Respondents were

instructed to complete the survey during August 2000 and return it by September 15th, 2000. Responses received before September 15th were included in the data set.

Measures and Multivariate Statistics

Three environmental measures were used in this study: one to indicate the degree of abandonment on a block, one to indicate social expression in abandoned lots, and one to indicate proximity to abandoned parcels on a block. The first two of these measures are contextual and clustered at the block level. The measure of proximity to abandoned lots is clustered at the parcel level. Because no respondents shared an address, the proximity measured is assumed to be suitable as an individual-level measure. All measures were made on August 1st, 2000.

The degree of abandonment was reflected by the percent of parcel abandonment on block. This percentage was calculated by dividing the number of total parcels on a residential block (including those home to religious organization buildings, if any) by the number of abandoned parcels. Property-tax maps from the City of New Haven's City Plan Department current to summer 2000 defined parcel boundaries. While there are many different ways to define abandonment, the approach we have taken is to identify lots that display an apparent dissociation from private owner control, a susceptibility to natural and accretive processes in the neighborhood environment and amenability to the exercise of social control whether formal or informal, civil or uncivil (Schukoske, 1999). Abandonment in this study is defined as any parcel meeting *one* of the four criteria in the Lot Abandonment Assessment Tool (see Appendix). Corner lots with the front side facing onto the intersecting street of a study block *were* included as part of the percent abandonment calculations. Given that parcels tend to be almost invariably

longer than they are wide, such lots (especially if abandoned) can manifest a considerable presence on the street on which they do not face.

Expression in the socio-physical environment was measured using the Environmental Expression in Abandoned Lots Scale (EEALS). The EEALS taps social use of abandoned residential lots along a blight/restoration dimension (the complete instrument is located in the Appendix). The EEALS records the presence or absence of seven characteristics (rubbish, waste removal, overgrowth, garden maintenance, formal paths, formal memorial objects, formal front edge boundaries) reflecting a combination of use patterns and natural or accretive processes along a dimension of social expression. (DINNO, 2000) The EEALS ranges from 0 to 7. A low EEALS score can be interpreted to indicate a blighted, socially non-cohesive use of the parcel, while a high score reflects its organized, vital and conscientious social use. EEALS item scores for each abandoned lot on a residential block were averaged for each study block, as was the scale score. Internal consistency reliability was computed using Cronbach's alpha with item-removal scores. A maximum-likelihood factor analysis of block-level indicated the acceptability of each scale item. A Scree test was performed to assess the dimensionality of this scale.

Proximity to abandoned lots was measured using the average distance to abandoned parcels (ADTAP). ADTAP is computed by averaging the distance in parcels from a respondent's address to each abandoned parcel identified on her street. Figure 1 illustrates the measurement of ADTAP for two respondents with different addresses on the same block.

FIGURE 1—Graphical parcel counting method to compute average distance to abandoned parcels (ADTAP). The three shaded areas represent the street-facing portions of three abandoned lots on both sides of a residential block of a hypothetical Easy Street. A and B represent the address lots of two respondents. The distance from one lot to the next is counted in parcels. For example, the person living at A is a distance of two parcels from the abandoned lot 1. The street is counted as a single parcel if an abandoned parcels lies on the opposite side of the street. So A is also a distance of 2 from lot 3. The ADTAP for the person living at A is 2.7 [(2+2+4)/3)] and the ADTAP for the person living at B is 6.3 [(4+6+7)/3]. Note that the distance counted from B to 1 is 7 if one counts along the same side of the street as B before counting the street, and 9 if one counts the street before counting parcels. In this study ADTAP is always calculated using the smallest distance counts for each lot to each respondent address. Note: in this simple illustration, the percentage of parcel abandonment is 15% (the long parcels at the upper right and lower left are included in this calculation, though they do not face onto Easy Street).
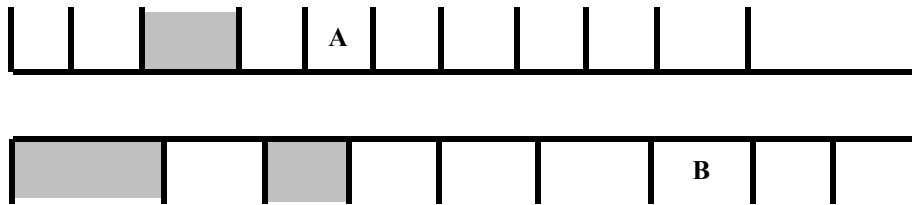
There were five psychosocial measures of health employed in this study. Two of these tap self-perceived emotional response to the neighborhood, one taps self-reported safety-related behavior and two tap self-reported violence in the neighborhood. All of these psychosocial measures are individual-level data provided through the survey instrument.

Measures tapping different aspects of emotional response were assessed through a section of 14 questions. This section asked respondents if "in the last month do you think that living on your block has contributed to feeling…" for fourteen word or phrase descriptions of affective states. Respondents answered yes, no, can't say/unsure or refused to answer. Items were scored one point for a positive response and zero for a negative or can't say/unsure response. These fourteen questions were formed of two, seven-question scales, one tapping well-being-related affect and the other stress-anger-anxiety-related affect. These two dimensions are referred to as positive and negative emotionality. Items in the negative emotionality scale were adapted from scales used in the Connecticut Women's Reproductive Health Study (Jeanette Ickovicks et al, 1999) including the short 10-item version of the Perceived Stress Scale by Sheldon Cohen and

depression and anxiety portions of Leonard Derogatis' Brief Symptom Inventory and tailored to the neighborhood context. Several of the response items in the positive emotionality scale were adapted from this instrument also. Each item in the positive emotionality scale corresponds to a single item in the negative emotionality scale. The seven items of each scale are summarized in Table 1. Internal consistency reliability for each was computed using Cronbach's alpha with item-removal scores. Maximum-likelihood factor analyses of block-level were computed to evaluate the acceptability of each scale item. Scree tests were performed to assess the dimensionality of these scales.

TABLE 1—Summary of response items from positive emotionality and negative emotionality scales.

Positive Emotionality	Negative Emotionality
relaxed with your surroundings	isolated from your neighbors
happy to be part of the neighborhood	irritated or temperamental
confident in your ability to handle neighborhood interactions	nervous
hopeful about the future	angry because things in your neighborhood were beyond your control
like you are part of a tightly-knit community	afraid
blissful of uplifted	blue
safe	hopeless about the future

Self-reported safety-related behavior was assessed by two questions pertaining about hesitation that were scored together. One question asked "In the past month, how often have you hesitated to invited friends, schoolmates or coworkers to your home from some other neighborhood because you worried about their safety?" The second question asked "In the past month, how often have you hesitated to go outside on your block in the daytime?" Both questions invited responses to a five-point ordinal scale (never, occasionally, about half the time,

frequently, all the time; scored 0 through 4) and allowed different can't say/unsure and refusal responses. These questions were scored by summation.

Two four-question indexes were used to measure different facets of self-reported violence within the respondent's residential block. The first index asks questions about witnessing others in violent situations both verbal and physical, both inside and outdoors on the block. The second index asks questions about witnessing or experiencing verbal or physical violence in the outside neighborhood. The two indexes share two questions (the two about witnessing physical and verbal confrontations outside). All questions invited responses on a five-point ordinal scale (not at all, a little, some, quite a bit, a lot; scored 0 through 4) and allowed different can't say/unsure and refusal responses. These questions were scored by summation. The multivariate analyses described above, descriptive statistics and subsequent regression estimates were performed using STATA.

Regression Analyses

A set of survey regressions was estimated using the above measures. All regressions employed both probability weights and the residential block as the primary sampling unit. The first set predicted positive emotionality, negative emotionality, self-reported safety-related behavior, witnessing others in violent confrontations and witnessing or experiencing violent confrontations in one's outdoor neighborhood as a function of the block EEALS score, block percent abandonment, respondent ADTAP, URI project status and interaction terms between the three environmental indicators in five separate multiple survey regressions. Final survey regressions were determined by stepwise backward selection starting with the model incorporating seven predictors (three environmental indicators, three two-way interaction terms,

and project status). Models were retained only if all interaction terms or main effect terms without interaction terms were significant at the 0.1-level. Each modeling step removed the single interaction term with the highest p>|t| value until the retention conditions were met. If the model did not meet retention conditions after removing all interaction terms, then the environmental main effect term with the highest p>|t| value was eliminated until retention conditions were met. All final models were estimated along with the same model minus the project status term and with simple survey regressions employing the presence or absence of a URI summer 2000 greenspace project as a single predictor. Observations with data missing from one or more predictors were dropped. Because of the small sample size in this pilot study, and because of the exploratory nature of its analyses, observations were dropped only for variables relevant to the individual stepwise regression (i.e. the N is different for the self-reported hesitation-related behavior and positive affect model sets). However, the same exclusion criteria were employed for all three models within a regression set (i.e. the environmental predictors only, project status predictor only and environmental and project status predictors models share the same N).

Results

Population and Descriptive Statistics

Of 383 surveys distributed to 13 eligible sites located in Newhallville (7), Hill (4) and Easthaven (2) wards, 27 surveys were returned, giving an overall response rate of 7%. Descriptive data for the major variables are presented in Table 2 (N varies based on missing observation exclusion from regression analyses).

TABLE 2—Descriptive statistics for the scored measures employed in this study. Because of the limited number of observations in this study, data for health and safety outcomes are presented with for those observations used in the associated regressions in Tables 3–7. Data for environmental variables and summer 2000 project status are presented for observations with complete data in these four variables.

Variable	Mean	Min	Max	N
Positive Emotionality	1.67	0	7	21
Negative Emotionality	4.14	0	6	21
Hesitation-related behavior	0.80	0	6	20
Reported Violence Against Others	3.28	1	7	18
Reported Violence Outside	3.26	1	10	19
Summer 2000 Project Status	0.48	0	1	23
EEALS Score	2.69	1	6	23
ADTAP	6.27	2.2	11.33	23
Percent Abandonment on Block	0.25	0.07	0.50	23

Measurement Reliability

Internal consistency reliability for block EEALS scores was 0.81 for the 16 observed blocks containing all scores. The Scree test (not shown) supported a single dimension interpretation of the EEALS construct. Maximum-likelihood factor analysis of a single factor with fifty optimizations having random starting values to insure the location of a global, rather than local, maximum likelihood (STATA, 2000) confirmed all scale items at the 0.3-level. Factor loadings ranged from 0.32 to 0.99.

Internal consistency reliability for positive emotionality scores was 0.82 for the 26 observations from respondents who answered either yes or no for all items on this scale. The Scree test (not shown) supported a single dimension interpretation of the positive emotionality construct. Maximum-likelihood factor analysis of a single factor with fifty optimizations having random starting values to insure the location of a global, rather than local, maximum likelihood (STATA, 2000) confirmed all scale items at the 0.35-level. Factor loadings ranged from 0.39 to 0.89.

Internal consistency reliability for negative emotionality scores was 0.82 for the 26 observations from respondents who answered either yes or no for each item on this scale. The

Scree test (not shown) supported a single dimension interpretation of the negative emotionality construct. Maximum-likelihood factor analysis of a single factor with fifty optimizations having random starting values to insure the location of a global, rather than local, maximum likelihood (STATA, 2000) confirmed all but one of the scale items at the 0.35-level. Factor loadings ranged from 0.39 to 0.95. Internal consistency reliability for the six retained item scores was 0.84.

Regression Estimates for Positive and Negative Emotionality

The presence of a URI summer 2000 greenspace project was found to produce a marginally significant increase in response on the positive emotionality scale when controlling for associations with the three environmental predictors, including the interactions between average distance to abandoned lots and both EEALS scores and percent abandonment (Table 3, Model 3; 2.56-point *increase* on positive emotionality scale with presence of project; 95% confidence interval [CI], -0.30 to 5.41; P = 0.07). This model supports the study hypothesis, and explains 51% of the variation in positive emotionality scores significant at the 0.01-level (F < 0.01). This is a 4% increase in explained variation over the sum of explained variation in Models 1 and 2. No significant effect was found for project status alone (Table 3, Model 2).

The presence of a URI summer 2000 greenspace project was found to produce a highly significant decrease in response on the negative emotionality scale when controlling for associations with the environmental predictors, including interactions between average distance to abandoned lots and both EEALS scores and percent abandonment (Table 4, Model 6; 4.92-point *decrease* on negative emotionality scale with presence of project; 95% CI, -6.44 to -3.39; P < 0.001). This model supports the study hypothesis, and explains 52% of the variation in negative emotionality scores significant at the 0.05-level (F = 0.03). This is a 33% increase in

explained variation over the sum of explained variation in Models 4 and 5. No significant effect was found for project status alone (Table 4, Model 5).

TABLE 3—Estimated multiple survey regressions predicting positive emotionality as a function of the environmental expression in abandoned lots scale, percent abandonment on block, average distance to abandoned parcels and the presence of summer 2000 community greenspace projects.

	Model Number		
	(1)	(2)	(3)
	Positive Emotionality	Positive Emotionality	Positive Emotionality
Environmental Expression on Abandoned Lots Scale (EEALS)	1.63 (3.43)**		1.68 (3.18)**
Percent of parcel abandonment on block	50.54 (4.09)**		64.03 (4.64)***
Average distance to abandoned parcels (ADTAP)	1.30 (10.19)***		1.19 (6.76)***
Interaction between EEALS and % abandonment on block	-12.36 (3.52)**		-18.00 (4.33)***
Interaction between % abandonment on block and ADTAP	-4.74 (7.15)***		-4.46 (4.87)***
URI Project Status. 0: No project in 2000; 1: Yes project in 2000		-0.73 (0.78)	2.56 (1.99)~
Constant	-7.98 (4.79)***	1.627 (2.39)*	-8.50 (4.80)***
Observations	21	21	21
R-squared	0.43	0.04	0.51

Absolute value of t-statistics in parentheses
~ significant at 10% level; * significant at 5% level; ** significant at 1% level; *** significant at 0.1% level

The presence of a URI summer 2000 greenspace project was found to produce no significant decrease in response on self-reported hesitation-related behavior when controlling for associations with all three environmental predictors, including interactions between EEALS score and both average distance to abandoned lots and percent abandonment (Table 5, Model 9; no significant effect of project on hesitation-related behavior; 95% CI, -1.49 to 0.21; $P < 0.12$). This model does not provide evidence supporting the study hypothesis, but it explains 41% of observed variation in positive emotionality scores significant at the 0.05-level ($F < 0.0001$), which is less than the sum of variance in hesitation-related behavior explained by models 7 and 8, suggesting very poor fit. No significant effect was found for project status alone (Table 5, Model 8).

TABLE 4—Estimated multiple survey regressions predicting negative emotionality as a function of the environmental expression in abandoned lots scale, percent abandonment, average distance to abandoned parcels on block and the presence of summer 2000 community greenspace projects.

	Model Number		
	(4)	(5)	(6)
	Negative Emotionality	Negative Emotionality	Negative Emotionality
Environmental Expression on Abandoned Lots Scale (EEALS)	-0.44 (0.91)		0.20 (0.52)
Percent of parcel abandonment on block	-2.70 (0.79)		13.02 (4.17)**
Average distance to abandoned parcels (ADTAP)	-0.63 (2.14)~		-0.29 (1.27)
Interaction between EEALS and ADTAP	0.10 (1.64)		0.27 (4.71)***
Interaction between % abandonment on block and ADTAP	1.13 (1.36)		-2.70 (4.03)**
URI Project Status. 0: No project in 2000; 1: Yes project in 2000		-0.69 (0.83)	-4.92 (7.30)***
Constant	6.87 (2.76)*	4.94 (8.52)***	4.25 (1.95)~
Observations	21	21	21
R-squared	0.14	0.05	0.52

Absolute value of t-statistics in parentheses
~ significant at 10% level; * significant at 5% level; ** significant at 1% level; *** significant at 0.1% level

The presence of a URI summer 2000 greenspace project was found to produce a significant increase in response on score of reports of witnessed violence affecting others when controlling for associations with all three environmental predictors, including interactions between average distance to abandoned lots and both EEALS score and percent abandonment (Table 6, Model 12; 0.79-point increase on score of witnessed violence against others; 95% CI, -0.12 to 1.45; P = 0.011). Model 12 provides evidence against the study hypothesis. This model explains 51% of the variation in scores of reports of witnessed violence against others marginally significant at the 0.10-level (F = 0.08), which is less than the sum of variance in hesitation-related behavior explained by models 10 and 11 suggesting poor fit of the model. No significant effect was found for project status alone (Table 6, Model 11).

TABLE 5—Estimated multiple survey regressions predicting self-reported hesitation-related behavior as a function of the environmental expression in abandoned lots scale, percent abandonment on block, average distance to abandoned parcels and the presence of summer 2000 community greenspace projects.

	Model Number		
	(7)	(8)	(9)
	Self-reported hesitation-related behavior	Self-reported hesitation-related behavior	Self-reported hesitation-related behavior
Environmental Expression on Abandoned Lots Scale (EEALS)	-0.24 (1.66)		-0.24 (1.70)
Percent of parcel abandonment on block	-14.61 (3.14)*		-19.14 (3.59)**
Average distance to abandoned parcels (ADTAP)	0.56 (8.67)***		0.60 (8.14)***
Interaction between EEALS and percent of parcel abandonment on block	6.37 (4.58)***		8.09 (4.77)***
Interaction between EEALS and ADTAP	-0.15 (5.40)***		-0.16 (5.51)***
URI Project Status. 0: No project in 2000; 1: Yes project in 2000		0.69 (1.23)	-0.64 (1.71)
Constant	-0.38 (0.70)	0.50 (1.67)	-0.23 (0.43)
Observations	20	20	20
R-squared	0.40	0.08	0.41

Absolute value of t-statistics in parentheses
~ significant at 10% level; * significant at 5% level; ** significant at 1% level; *** significant at 0.1% level

TABLE 6—Estimated multiple survey regressions predicting witnessed violence affecting others as a function of the environmental expression in abandoned lots scale, percent abandonment on block, average distance to abandoned parcels and the presence of summer 2000 community greenspace projects.

	Model Number		
	(10)	(11)	(12)
	Witnessing violence affecting others	Witnessing violence affecting others	Witnessing violence affecting others
Environmental Expression on Abandoned Lots Scale (EEALS)	-3.76 (4.03)**		-4.05 (4.21)**
Percent of parcel abandonment on block	19.11 (4.86)***		17.58 (4.17)**
Average distance to abandoned parcels (ADTAP)	0.02 (0.08)		-.06 (0.25)
Interaction between EEALS and ADTAP	0.42 (3.39)**		0.41 (3.36)**
Interaction between % abandonment on block and ADTAP	-4.24 (5.33)***		-3.73 (4.36)**
URI Project Status. 0: No project in 2000; 1: Yes project in 2000		-0.68 (0.90)	0.79 (2.73)*
Constant	7.14 (3.18)*	3.66 (4.80)*	7.72 (3.30)*
Observations	18	18	18
R-squared	0.51	0.04	0.51

Absolute value of t-statistics in parentheses
~ significant at 10% level; * significant at 5% level; ** significant at 1% level; *** significant at 0.1% level

The presence of a URI summer 2000 greenspace project was found to produce no significant effect on response on score of reports of witnessed or experienced violence in the

outdoor neighborhood others when controlling for associations with block EEALS scores, percent of parcel abandonment and average distance to abandoned parcels, and including all three two-way interactions between these predictors (Table 7, Model 15; no significant effect on score of witnessed or experienced violence in the outdoor neighborhood; 95% CI, -7.86 to 4.30; $P = 0.53$). This model does not support the study hypothesis. This model explains 67% of the variation in scores of reports of witnessed violence against others marginally significant at the 0.10-level ($F = 0.08$). This is less than the sum of variance in hesitation-related behavior explained by models 13 and 14 suggesting poor fit of the model. No significant effect was found for project status alone (Table 7, Model 14).

TABLE 7—Estimated multiple survey regressions predicting witnessed or experienced violence in the outside neighborhood as a function of the environmental expression in abandoned lots scale, percent abandonment on block, average distance to abandoned parcels and the presence of summer 2000 community greenspace projects.

	Model Number		
	(13)	(14)	(15)
	Witnessing or experiencing violence outside	Witnessing or experiencing violence outside	Witnessing or experiencing violence outside
Environmental Expression on Abandoned Lots Scale (EEALS)	-0.14 (0.07)		-0.06 (0.03)
Percent of parcel abandonment on block	122.23 (2.67)*		110.22 (2.25)~
Average distance to abandoned parcels (ADTAP)	-0.38 (1.15)		-0.24 (0.61)
Interaction between EEALS and % abandonment on block	-31.54 (2.63)*		-26.98 (1.99)~
Interaction between EEALS and ADTAP	0.90 (3.03)*		0.86 (2.84)*
Interaction between % abandonment on block and ADTAP	-10.90 (3.10)*		-10.92 (3.27)**
URI Project Status. 0: No project in 2000; 1: Yes project in 2000		-2.01 (1.27)	-1.78 (0.66)
Constant	-1.55 (0.41)	4.55 (2.96)*	-1.34 (0.37)
Observations	19	19	19
R-squared	0.66	0.11	0.67

Absolute value of t-statistics in parentheses
~ significant at 10% level; * significant at 5% level; ** significant at 1% level; *** significant at 0.1% level

The simple OLS regression of URI project status as a predictor of environmental expression of social norms on abandoned lots found a significant increase in EEALS scores associated with URI project status (Table 8, Model 16; a 2.16-point increase in EEALS was

associated with presence of URI summer greenspace programs; P < 0.001; 95% CI, 1.48–2.84), confirming this study hypothesis. This model explains 68% of the variation in EEALS scores, and is highly significant (F < 0.0001).

TABLE 8—Estimated simple OLS regression predicting environmental expression on abandoned lots scale score as a function of URI summer 2000 community greenspace project status.

	Model Number
	(16)
	Environmental Expression on Abandoned Lots Scale
URI Project Status. 0: No project in 2000; 1: Yes project in 2000	2.16 (6.63)**
Constant	1.65 (7.32)***
Observations	23
R-squared	0.68

Absolute value of t-statistics in parentheses
˜ significant at 10% level; * significant at 5% level; ** significant at 1% level; *** significant at 0.1% level

Discussion

As a pilot study, CHAURLS was successful in producing findings with implications for action, evolved understanding of the relationships between socio-physical spaces and their occupants, and further research in this area. While the small sample size devalues a substantive interpretation effect sizes in from the regression models, the consistent pattern of highly significant results in all models and the high R^2 in both environmental predictor only, and environmental predictor plus URI project models justifies the hypothesized relationships. In finding, that URI community greenspace projects are, as expected, significantly associated with changes in positive and negative affect of local residents is evidence that processes of social and physical organization in residential abandoned lots contributes to emotional well-being. At the same time, URI projects were found to be predictors of increased report of violence affecting others in the neighborhood.

This finding bears careful consideration given widespread concerns about violence in the community, and especially given the relevance of block-watch organizations in initiating greenspace projects. Individuals involved with neighborhood restoration (many of whom are also involved in neighborhood block-watch programs) report a conviction that a restoration project has contributed to the turn around of violence and antisocial patterns in a marginalized neighborhood. "Daisies beat drug deals" is an oft-echoed phrase from resident experiences in streetscaping with trees and flowerbeds in New Haven's Newhallville ward. Members of the Arch Street neighborhood group maintain a superlative community garden on the site of three abandoned lots amid a generally maintained passel of abandoned parcels. Arch street residents report an increase in feelings of community togetherness, a decrease of fear of violence on the street and a renewed commitment by residents to remain and reclaim their neighborhood over the five years of the greenspace project. And then there is the haunting message from a resident of one 1999 project location "Happier with the neighborhood recently. I don't see as many shootings." (Dinno, 2000)

Clearly there is a perception that safety on a resident's block can change, and that such changes have been associated with either the condition of abandoned lots, or with the social processes of environmental expression within and around those spaces or both. But other perceptions stand in contrast to these at the same time. During the course of summer 2000 Community greenspace work I was engaged in preliminary site evaluation work for a site that had been designated as a potential project site. During a site trip to the lot I and a landscape architect were approached by several of the lot's immediate neighbors who reacted in hostile fashion upon hearing that other neighbors were interested in developing a community garden there, one even threatening to litigate. Among their primary concerns was the expected *decrease*

in safety expected as a result both of the changes and through the process by which those changes were to be engaged. Alarm was focused on the threat of harm to children brought by an expected increase of auto traffic, creating a haven for drug use and dealing and creating an entrance for undesirable members of the rehabilitation clinic and the housing projects in the vicinity by creating a cooperative social event.[2] This experience is not unusual for URI abandoned lot projects. Frequently community members (particularly in the more blighted neighborhoods) articulate fears that creating a welcome space on their block will necessarily create a welcome for drug use, gang activity and prostitution. In such communities abandoned lot projects are typically limited to clean-up, overgrowth clearing, and landscape design elements intended to discourage use of the space. Given these qualitative observations, one interpretation of finding increased report of violence against others associated with URI projects is that greenspace projects are associated with increased vigilance within the community. Measuring and testing such an effect is problematic given the security-induced secrecy with which such organizations operate (i.e. New Haven police do not maintain a public list of either blockwatches, nor of their members). Another possible explanation is that URI projects reflect action by many communities at turning points in their stories. So greenspace projects may be more likely to occur near an historically high-violence period in a community. Further research might test this by accounting for past history of URI projects or past expression of socio-environmental norms. Most importantly, URI and other such actors should be highly sensitive to and document the safety concerns of community members relative to greenspace projects.

Just as important as the findings of association with URI project status are the significant associations of both contextual-level and the one individual-level environmental measures with

---

[2] The project was dropped and URI apologized to the offended community members.

health measures in all models. If these are true relationships, then the quality of the socio-physical environment and the capacity of people to change that environment is relevant to health in terms of chronic psychosomatic stress in the daily environment and in terms of promoting resilience through emotional and social well being. Because children and the elderly (and the poor more generally) are less mobile, the daily residential environment is particularly important, and investment in processes that improve such environments are therefore appropriate loci of health intervention.

The primary implication of these quantitative analyses for URI and similar programs or organizations that mobilize change in the socio-physical environment is that they are health interventions and actors. Those implementing community greenspace projects ought to recognize the role they play in affecting mental health. The role of social organization in environmental process may be the most important component of such projects and should be valued as such. Social and environmental justice and advocacy need not be limited to concern about toxins in the local environment, but should engage health in a complete and holistic sense.

From methodological perspective, this study provides insight into the useful application of measures of socio-physical environment. Unwittingly paralleling the ecometric approach advocated by Raudenbush and Sampson (1999), this observational approach to assessment of properties of neighborhoods permits contextual analyses appropriate to true multilevel modeling, measures that are independent of psychometric measures of individuals. At the same time, the ecometric approach permits (given a longitudinal study design) the evaluation of multiple units of analysis: individual people and individual places. This could allow research strategies to disentangle the life course of people, from the life course of places—both of which are of substantial interest for intervention. Findings of high reliability help affirm the EEALS and

support its validity. The significant association between URI project status and improved EEALS score supports construct validity for the scale. Measure of inter-rater agreement (kappa) of EEALS across a 1999 *individual-level* assessment of 7 lots was 0.83 (p<0.0001) using a prior version of the EEALS instrument. The current version refined assessor instruction for each item (sub-domain definition and response-item instruction), and should produce better inter-rater reliability. At the same time, intensive and extensive improvements to the EEALS seem appropriate. The Appendix includes a more formal definition of the scale and each of its subdomains, as well as an extended scale adding several new items, and an intensively improved version of the extended scale which expands responses from simple presence or absence indicators. Both improvements are expected to increase the reliability of the EEALS. The scale potentially lends itself to application of urban residential lot assessment beyond the New Haven context. It is rapidly employed, requiring between 30–60 seconds per abandoned parcel for a trained assessor. Because the instrument is design for assessment from a street-facing-property vantage, it may be appropriately applied to photographic or video data such as that presented by Sampson and Raudenbush in the Chicago neighborhood study (Sampson and Raudenbush, 1999), although the scale must be validated for such use. Because the EEALS was developed within New Haven at the beginning of the 21st century, cultural idiosyncrasies of the city's physical stock, socio-political arrangements of public, private, non-profit and social institutions and the demographic exigencies of daily life may have colored the assessment tool (for example, overgrowth of residential lots as a biological process occurs at different spatial and temporal scales in Albaquerque, New Mexico than in New England), and may require further refinement. The relevance of abandonment in areas with low overall levels of abandonment is unknown.

Aggregated EEALS scores can, however, be produced for block-level, school-area-level, census tract level—or in fact any larger spatial bounding of theoretical or empirical interest.

The study was limited in several respects beyond the most obvious problem of small sample size. First, existing psychometric and sociological measures of mental health and well-being and of perceived violence which have already been validated are more appropriate.

Second, important confounders (age, gender, ownership status, length of residency, etc.) were noticeably absent from the analyses. Further research with greater statistical power would permit the assessment of the role of such variables in the hypothesized relationships.

Third, the hypothesized models reflect a methodological limitation of excluding mediating pathways between variables. For example, URI project status predicts EEALS score, which in turn predicts emotionality. However, URI project status in and of itself also predicts emotionality, but the models tested do not reflect this. Path analyses would provide one analytic strategy for addressing this shortcoming. But it is quite likely that several of the health outcomes (perception of violence and safety, emotionality, safety-related hesitation) themselves causally influence social and environmental processes within the neighborhood. Personal observation and involvement with the URI community greenspace programs provides many insights about the way that shared outdoor space, community capacity for environmental expression and perceived security affect one another and how the hypothesized relationship system provides a challenge for quantitative modeling. All these observations inform the articulation of a causal model that underlying the hypothesized relationships. Consider that feelings and expectations about the environment's social use can (apparently) both encourage and discourage changes in landscape use. Put another way, perceptions about things like safety may affect land use behavior. Clearly

also land use behavior can change the quality of a physical landscape.[3] And, if the perceptions of some residents are to be believed, changes in landscape use may indeed influence one's experience within that environment. Finally, one resident's observation of another resident's behavior can seemingly engender powerful thoughts and feelings (consider the neighbor who threatened to litigate). Figure 2 illustrates a complex, triadic model of reciprocal causation which may represent true relationships within these neighborhoods.[4] A simplified version of the kind of model specified with the measured constructs of this study treating this assumption of reciprocal (and lagged) causality is illustrated in Figure 3.

FIGURE 2—General schematic of health/environment relationships. The arrows specify causal associations between different elements. Interdependence is assumed via reciprocal and time-lagged pathways. Environmental Condition and Individual Effect are individual-level objects that are the subject of separate classes of analytical unit. Both environmental and individual analytic classes share Land-Use Behavior objects. Contextual-level variables such as geographic clusters or population values may affect both environmental and individual objects, but are assumed to affect Land-Use Behavior through mediation.

---
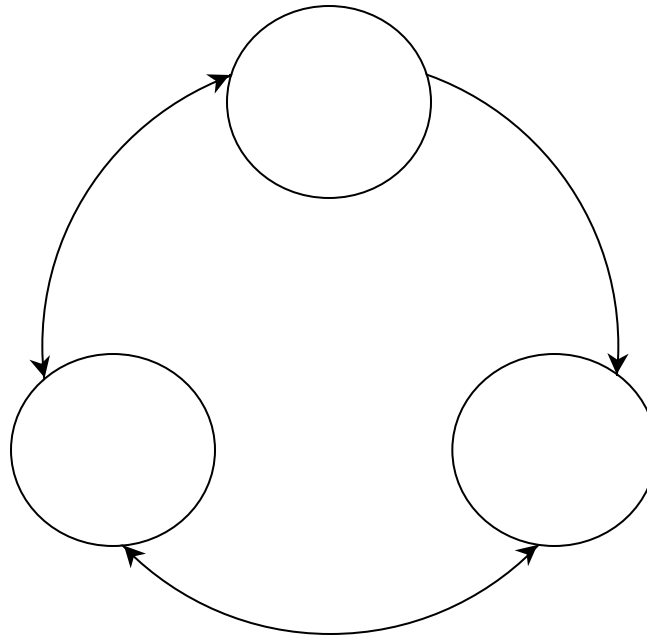
[3] Perhaps not so clearly. Models of environmental interactions with health often—at least within traditional environmental health sciences—ignore the possibility of the environment being shaped by the health factors of interest. We are recognizing here that health is not merely some dependent outcome, but part of a complex causal chain.

[4] Unlike some other causal path conventions (such as that employed in Figure 3) which depict time as flowing from left to right, time in this illustration should be interpreted as pervading each element. In other words, the reader is staring "head on" at the arrow of time.

FIGURE 3—Schematic conceptualization of direct causal pathways between neighborhood residents' perceived well-being, the character of their neighborhood environment and social behavior affecting both individual well-being and the physical environment. Employing the convention of time moving from left to right, the impact of these elements depends upon previous conditions (and perhaps concurrent for certain of them).
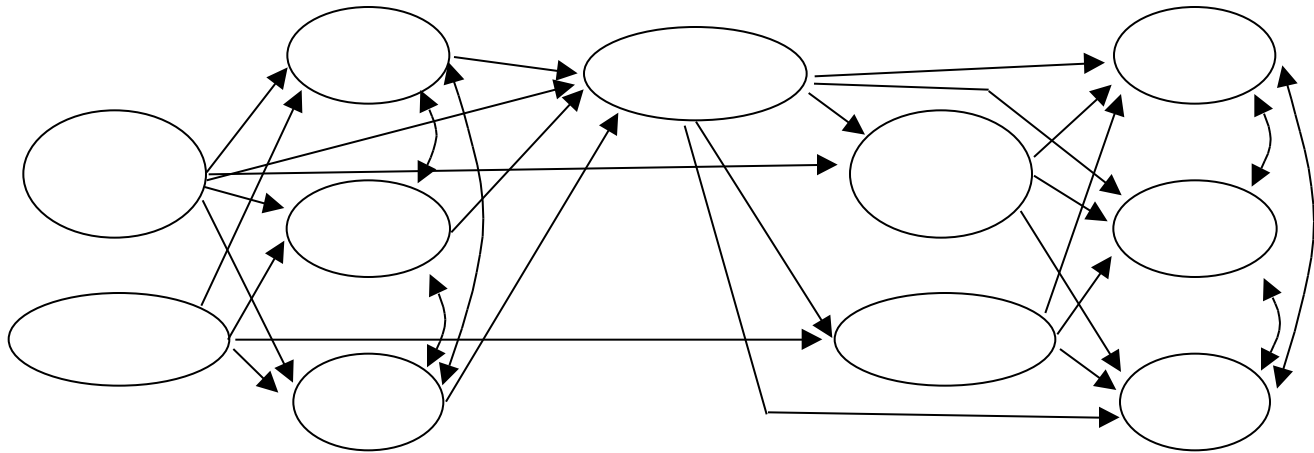
The appropriate analytic strategy for such a causal model would be suited to a longitudinal, LISREL analysis incorporating analysis of latent construct measures, complex path analysis and multilevel approaches.

Research stemming from this pilot study may take several directions. In additions to the improvements in measures, sample size and underlying causal model with appropriate analytic strategy discussed above, a longitudinal follow-up design would permit causal inference, especially around the complexities of changes in violence and safety perceptions relative to changes in socio-physical organization. Multi-city/multi-regional studies would help answer questions about the generality of these relationships, and the degree to which they vary. Additionally the ecometric approach taken in constructing the EEALS may be extended to measuring environmental expression in other kinds of place (streetscapes, parks, schools, shared workspace, etc.). Such efforts may provide empirical support for the development of a

generalized social theory of place linking social norms and behavior with physical spaces and structures under a unified methodological framework.

Appendix

Lot Abandonment Assessment Tool

Characteristic	Present	
	Yes	**No**
Condemned House The residential structure on the parcel is posted with a City of New Haven notice of condemned, auction, etc.	___	___
No Structure On Lot The parcel is unbuilt, containing no residential structure.	___	___
Wrecked or Partial Wrecked Structure The residential structure is wrecked (i.e. half-burned, missing walls, missing a roof, etc.).	___	___
No Windows (100% Broken or Boarded) All first-floor or higher windows on the side of the residential structure facing the street are broken, missing or boarded.	___	___

A yes answer to any of the above indicates a designation of abandonment.

Environmental Assessment of Abandoned Lots Scale

Assessor: **Date:**

Parcel Address:

Characteristic	Present	
	Yes	**No**
Rubbish Cast off mattresses, discarded garbage bags not set out for removal, furniture, appliances, automotive detritus, etc. and waste associated seasonal or non-periodic dumping indicate presence.	___	___
Waste Removal Filled and tied garbage bags, stacked disposables, material curbed and awaiting pickup, obviously engaged in waste gathering like clipping piles, permanently installed garbage cans, etc. indicate presence.	___	___
Overgrowth Occlusion of paths, drives, doors, porches etc. by shrubs and trees, colonization of open spaces (as opposed to at edges and fences) by pioneer species like Ailanthas or bamboo, grass and weeds gone to seed in places where they are normally kept trimmed, etc. indicate presence.	___	___
Garden Maintenance Designed garden features like perennials planted this season, maintained trees or hedges, lawn, etc. indicate presence. Assessors ought to be sensitive to climatic factors such as drought or winter that may detract from even the best maintained gardens.	___	___
Formal Paths Lined or paved walks, gateways, driveways or parking spaces, etc. indicate presence.	___	___
Formal Memorial Objects Mural graffiti, sculpture, monuments, benches, plaques, birdbaths, etc. indicate presence.	___	___
Formal Front Edge Boundaries Cyclone fences, LCI corral fencing, berms, etc. indicate presence.	___	___

Neighborhood Emotion and Safety Survey

This survey should take 5 to 10 minutes to complete. All survey responses are confidential and will be seen only by the research investigator. Please complete the survey during August 2000 and mail by August 31st. We have enclosed an addressed stamped envelope for your convenience. Only the shaded pages need to be returned.

Today's Date   ___ / ___ / ___

What is your date of birth?   ___ / ___ / ___

Gender:

○   Male
○   Female   ○   _____

What is your current address?   _____

How many years have you lived at this address?   ___

Do you or someone in your household own this residence?

○   Own
○ Rent