NEIGHBORHOOD-LEVEL LINKS BETWEEN PHYSICAL FEATURES AND LOCAL SENTIMENTS

DETERIORATION, FEAR OF CRIME, AND CONFIDENCE

RALPH B. TAYLOR, SALLY ANN SHUMAKER, AND STEPHEN D. GOTTFREDSON

The research described here was undertaken in order to understand some of the roles that the physical environment may play at the neighborhood level. More specifically, impacts of physical environment on local sentiments such as fear of crime and neighborhood confidence were investigated. Extant theories were drawn on to support the hypothesis that higher levels of physical decay or deterioration would be associated with higher levels of fear of crime, and lower levels of neighborhood confidence. A more conditional model of physical impacts was also proposed, which suggested that negative impacts of physical environment would be demonstrated only in neighborhoods with moderate-income residents. These hypotheses were tested in 66 neighborhoods in Baltimore City (MD). Twenty percent (n = 808) of all occupied street blocks in these neighborhoods were assessed by trained teams of raters. The items assessed had high levels of interrater reliability. From these items we were able to produce two clear-cut, independent physical dimensions: physical decay, and nonresidential versus residential land use. Zero-order correlations of the decay parameter with perception of physical problems, fear, and confidence were quite high. Physical decay was not linked to attachment. When socioeconomic characteristics of the full set of neighborhoods were partialled, the links between physical environment and local sentiment were weakened considerably. Thus the general model of physical impacts was not strongly supported. The proposed conditional-level model, however, received strong confirmation. In moderate-income neighborhoods, controlling for social class, physical decay was clearly tied to local sentiments. These results disconfirm some broad-gauged theories about neighborhood-level physical impacts that have been proposed, but they suggest that physical impacts are conditional, i.e., dependent upon overall neighborhood context and how residents "explain" the causes of surrounding physical conditions.

Points of view or opinions expressed here are solely those of the authors and in no way reflect the opinions or official policies of the National Institute of Justice or the Department of Justice. Portions of this research were presented at the annual meetings of the Environmental Design and Research Association, 1982, College Park, MD.

Department of Criminal Justice, Temple University, Philadelphia, Pennsylvania (R.B.T., S.D.G.) and National Institute of Health, Rockville, MD. (S.A.S.)

Address reprint requests to Ralph B. Taylor, Department of Criminal Justice, Gladfelter Hall, Temple University, Philadelphia PA 19122.

Accepted October 16, 1984.

 0738-0894/85/$03.30

Environmental psychologists over the last two decades have devoted considerable attention to understanding the impacts of physical characteristics on human attitudes and social behavior. Recent textbooks in the area have linked physical characteristics with a diverse array of outcomes, including matters of stress and arousal, affect, frequency of usage of physical surroundings, and so on (Holohan, 1982; Fisher et al., 1984). At the same time, much of this attention has been focused on individuals and small groups. This fact is not surprising as environmental psychological theories are especially applicable to these areas (Stokols, 1977). We might suspect then that if we are concerned with the role of physical environment in community or neighborhood life we could turn to environmental sociologists for theoretical and empirical expertise in these areas.

When we turn to research in the area of environmental sociology, however, we find scant attention has been given to the role(s) of physical environment in neighborhood life (Dunlap and Catton, 1979). The focus of such research instead has been on the areas of the environmental movement, responses to environmental hazards, patterns of resource utilization, and so on. If we turn to urban sociology we find some research in the area of the role of the physical environment (Choldin, 1978), but not a lot. We have some dated work from the human ecology school linking community housing conditions to outcomes such as delinquency (for a review see Taylor, in press), but physical parameters have been by and large ignored by latter-day human ecologists (Michelson, 1970, chapter 1). In short, we have a very significant research gap. We know little about links between neighborhood life and neighborhood physical environment.

There are several reasons for this lack of information about the neighborhood life–physical environment link. In the sociologic area, there is a longstanding tradition of reducing physical facts to social facts, in the Durkheimian sense (Dunlap and Catton, 1983). When sociologists were first carving out their own unique area of inquiry it was necessary, in order to achieve a clear identity, to deny the importance of biologic and psychologic causal factors and to highlight the importance of social factors. This bias persists today. Second, it is very difficult to obtain good measures of neighborhood physical environments. The census, which social science researchers interested in community matters rely on heavily, is very skimpy on physical measures. Aside from house vacancies and numbers of rooms, there is little solid physical information. The Annual Housing Survey has a considerable number of physical measures, but because geographic location is not available it is not possible to merge AHS and census data at the neighborhood level. Consequently, to do in-depth studies of physical features it is necessary to go out and collect the data or unearth some locally available files, such as a PLAN file, maintained by many planning departments. Thus, disciplinary biases and required effort have resulted in little attention being given to neighborhood physical environments.

There is no lack of theory about neighborhood physical impacts, however, and research done at this level has been productive. To give just one example of such research, Greenberg et al. (1982) investigated high- and low-crime neighborhoods in Atlanta and found that the boundaries of the low-crime neighborhoods were significantly more "private" than the boundaries of the high-crime neighborhoods. Low-crime neighborhood boundaries tended to be lower-traffic-volume streets, to have fewer commercial establishments, and to be surrounded by industrial or nonresidential, noncommercial land use. Thus, the surrounding amenities gave people fewer excuses to approach or pass through the neighborhood, perhaps resulting in easier distinctions between outsiders and insiders, and thus less crime. This is just one example, and others could be given (see Taylor, 1982), of researchers who have found that, empirically, neighborhood physical environment is important. And, as suggested above, there are a number of theories that propose links between neighborhood physical environment and local sentiments. In this study we draw on two of these theories.

In the area of fear of crime, Hunter (1978; see also Skogan and Maxfield, 1981) proposed a theory to explain why fear of crime is so much more widespread than crime itself. The idea is that in areas that are "socially disorganized" not only do the residents experience crime, but they also experience social and physical incivilities. These are occurrences in the environment that indicate, to the perceiver, the breakdown of the moral order. Social incivilities include teens hanging out, being rowdy, dealing or doing drugs in public, or public drunkenness. Such instances indicate that coresidents no longer observe norms of appropriate public behavior. Physical incivilities include vacant or dilapidated housing, vacant lots, litter, graffiti, and so on. Such instances indicate that coresidents, or proprietors, no longer care about the locale, and that the agents of public order such as government and police are powerless to change things. On the basis of these "signs" residents infer that their community is going downhill and that nobody is doing or can do anything about it. Thus, the residents begin to fear for their own safety. Because these incivilities are more widespread than crime, this notion helps us understand why fear levels are higher than crime levels would warrant, or, stated differently, why people who have not been victims of crimes, or who have not seen crimes are afraid for their safety in the neighborhood. Consequently, this theory suggests that neighborhoods where incivilities are more prevalent would also have higher fear levels.

Another local sentiment that we are interested in is attachment to locale. Attachment to place refers to a system of positive affective bonds between an individual, a group, or a neighborhood population and the area in which they reside. Shumaker and Taylor (1983) have proposed a model of attachment that can operate at the individual, block or group, or neighborhood level. One of the hypotheses of Shumaker and Taylor's neighborhood-level model is that increasing physical quality of the environment results in higher levels of attachment to that setting. Fried (1982) has observed a similar link between satisfaction and physical quality of environment. The notion here is that an increase in physical quality results in more congruence between the positive image the neighborhood residents have of themselves, and their setting, and also permits a greater range of activities to be carried out in the setting. Thus, neighborhoods with more extant physical deterioration should have populations that are less attached to their neighborhood.

The last sentiment we investigated, one that was conceptually close to attachment, was neighborhood confidence, or perceptions of neighborhood improvement. We hypothesized that to the extent physical deterioriation was more widespread in a neighborhood, residents would be less likely to perceive that levels of upkeep were high or improving. Seeing this deterioration, and making an implicit connection between the quality of the residential environment and the quality of the residents, the residents would be less hopeful about the future of their neighborhood; they would think that it was "going nowhere." Thus, physical deterioration may undermine confidence in the future of the neighborhood.

We also proposed to test a more conditional or contextual model of physical environment impacts. This model assumed that surrounding physical features, such as decay, are interpreted differently in low-, moderate-, and high-income neighborhoods. In high-income neighborhoods, physical decay is not at all widespread; thus instances that do crop up (e.g., a vacant lot) will not be interpreted by residents as representing a trend in their locale. The neighborhood's high-income clientele guarantees a certain amount of stability. In low-income neighborhoods physical decay may not have much of an impact either, but for a very different reason. In low-income, predominantly rental areas instances of decay or unkempt property that emerge are not likely to be interpreted as reflecting behavior of the residents themselves. Instead, they will probably be interpreted as the results of outside forces, such as slumlords who no longer wish to try and keep up their property, or city agencies that are no longer trying to keep an area clean. Signs of physical deterioration will be interpreted as stemming from outside forces and not as a sign of resident attitudes and behaviors. Thus the deterioration will not result in increased fear or concern about neighbors and the neighborhood.

By contrast to the hypothesis regarding low-income neighborhoods, in moderate-income neighborhoods where there is some homeownership along with a significant volume of renters, the impacts of physical environment could be much more sizable. Because an area has some homeownership, unkempt or dilapidated yards or properties cannot be attributed solely to outside forces; local residents must shoulder some of the blame. At the same time such a neighborhood is not so established that residents are immune to incivilities that may occur. Rather, they may be very sensitive to such occurrences. Because the neighborhood is mixed in terms of tenure, and probably in terms of social class of residents as well, the long-term future of the neighborhood is open to question. Thus, if residents do see signs of decay this would be a cause of concern because it would indicate that their neighborhood might not have as bright a future as some had hoped. In short, in moderate-income neighborhoods, but not in low- or high-income neighborhoods, the impact of the physical environment on local sentiment may be sizable.

We proposed to test these hypotheses using data from a recent Baltimore study of neighborhood responses to disorder (Taylor et al., 1984). We were particularly interested in testing all these hypotheses at the neighborhood level as the hypotheses refer to neighborhood dynamics. Further, we were interested in testing these hypotheses while controlling for variation due to socioeconomic status (SES) of neighborhoods, or demographic makeup of neighborhoods. We wanted to control for variation because we anticipated that physical deterioration was more widespread in lower SES neighborhoods. And in lower SES neighborhoods we also expected residents to be more discouraged or fearful. Thus, the key test of our hypotheses was whether or not the proposed links held up after the covariation due to SES has been partialled out. If the links did not hold up it would suggest that the physical environment, net of population characteristics, does not contribute uniquely to explaining local sentiments. If this was the case, then theories, such as attachment and incivilities, that have given physical parameters a key explanatory role, might need to be reconsidered.

METHOD

Neighborhood Selection

Sixty-six Baltimore City (MD) neighborhoods were randomly selected for inclusion in the study. These neighborhoods represented slightly more than one-quarter (28%) of the city's 232 recognized neighborhoods. (For information on neighborhood definition see Taylor et al., 1979; Goodman and Taylor, 1983). The neighborhoods in the study ranged in population from 500 individuals to 10,000 individuals. When broken down by race the neighborhoods varied from over 99% Black to over 99% Caucasian; the average percent of Black residents was 44% in 1980. The sample included some very low-income areas, with high unemployment and poverty rates (e.g., 20% and 40%, respectively), and some fairly affluent areas where poverty and unemployment were minimal. In terms of tenure, neighborhoods ranged from almost all homeowner to almost all rental (average percent homeowned was 55%; SD = 21%). Median yearly (1980) household income was $14,274.

Neighborhood Surveys

In each selected neighborhood eight occupied street blocks were randomly selected, and on each block approximately three heads of households (or spouses of heads) were interviewed, for an average of 24.6 interviews per neighborhood. Over 80% of the interviews were conducted by phone, with the remaining interviews conducted in person. The response rate was over 70%. The interview, which took about 30 minutes, asked about household history, attitudes toward the neighborhood, local social involvements, and neighborhood expectations. The surveys were conducted in the summer of 1982.

Block Assessments

Twenty percent of the street blocks in the selected neighborhoods were randomly selected for on-site inspection of physical features (n = 808). Based on past research about physical features in relation to disorder (Taylor, 1982, in press), a range of physical factors was selected for assessment. These factors included features such as housing layout, setback, street length, street width, traffic volume, instances and types of nonresidential land use, graffiti, litter, persons hanging out, vacant lots, vacant buildings, and so on. A largely closed-ended observation sheet was prepared, and raters used a small commercial area nearby as a pilot observation area. The observation sheet was subsequently revised (copies are available from R.B.T.). Raters were also trained by using slides from a preexisting file of over 1200 slides of street fronts. The "master coder" picked slides that he felt reflected certain ratings on certain items; raters viewed these slides and rated them, and then the ratings were discussed.

All blocks were rated by a pair of raters. The raters were instructed to rate each block independently, not conversing with one another while they were making the actual ratings and not changing their ratings as a result of postrating discussions. Periodic trips were made by R.B.T. with the raters to monitor field procedures.

Subsequently, interrater reliability for individual items was assessed using the intraclass correlation. At the neighborhood level, all the items we subsequently used had very good levels of reliability; in all cases they exceeded 0.85, and most items had reliability levels above 0.90.

We then constructed neighborhood-level measures of each item, using the mean scores based on pairs of raters for each block, and subsequently examined bivariate scattergrams of individual assessment items in relation to crime levels. Items with significant relationships with crime were retained. We also built three subscales in cases where we had several items reflecting the same type of land use. One subscale measured high- versus low-accessibility streets in a neighborhood (internal consistency, by coefficient alpha, was 0.84). Neighborhoods with a high score on this subscale had a higher proportion of through as compared to nonthrough streets, wider streets accommodating more lanes of traffic, fewer one-way streets, more streets with center lines, higher traffic volume, more streets with bus stops, and were more likely to have high-pole as opposed to low-pole lighting.

A second subscale measured the presence of commercial or public service land uses that would draw foot traffic (alpha = 0.84). Neighborhoods with a higher score on the foot-traffic subscale were more likely to have outlets selling lottery tickets, small food stores, personal service establishments such as barbers and hair salons, employment sevices, or other commercial establishments.

A third subscale reflected the structural density of housing and block size (alpha = 0.56). Neighborhoods with a high score on this subscale had streets with long blocks, fewer blocks with setback housing, more stories in the buildings, and houses were less likely to be detached (more likely to be row houses).

We then carried out a principal-components analysis of the physical environment variables, including the above three subscales. The results appear in Table 1. Two components with eigenvalues > 1.0 were extracted; they accounted for 59% of the variance. The first component clearly reflected social and physical incivilities. Neighborhoods with a high score on this component had streets with people who appeared (to the observers) to be "hanging out," more dense housing with longer blocks, more vacant houses, and more litter and graffiti. We subsequently labeled this first component a "decay" factor. The second component reflected nonresidential versus residential land use. Neighborhoods with a high score on this component had blocks where there were more amenities drawing foot traffic, more instances of industrial or institutional land use, were more vacant lots, high-traffic-volume streets, parking lots, and less residential frontage. We labeled this a "nonresidential" factor.

Neighborhood Crime

We programmed crime data, provided by the Baltimore City Police Department, from crime-reporting areas into extant neighborhoods. (For details on the procedure, see Goodman and Taylor, 1983.) Data for all serious crimes were available for the period 1970 through 1980. For each neighborhood we constructed a serious-crime rate using data for

TABLE 1. Neighborhood-Level Principal Components Analysis of Physical Variables[a]

Variable or scale	Component I	Component II
Small groups	0.86	0.06
Commercial/industrial/institutional land use	0.13	0.86
Amenities drawing foot traffic	0.31	0.64
Housing density/block size	0.69	0.32
Volume of males on street	0.72	−0.04
Vacant houses	0.71	0.23
Vacant lots	0.14	0.50
Litter	0.69	0.46
Graffiti	0.78	0.33
High-traffic-volume streets	0.08	0.52
Percent residential frontage	−0.35	−0.84
Parking lots	0.04	0.77
Lambda	5.25	1.79
Variance explained (%)	43.8	14.9

[a]Varimax rotation. A total of 66 neighborhoods were surveyed. Coefficient alpha for items in Component I = 0.87; Component II = 0.77.

the last three years of this period, 1978–1980. By constructing a three-year average rate we avoided perturbations due to one neighborhood having a very high or low crime rate during a one-year period of time.

Census Data. We had also programmed some census information into the extant neighborhoods. Thus, in our analyses we could use census information on the SES of a neighborhood as well as information on the SES of a neighborhood based on our 25 surveys per neighborhood. The analyses we describe below, therefore, were carried out once using survey-based information as SES controls and once using census-based information as SES controls. There was no significant difference between the results obtained using census information and the results obtained using survey-based information for SES controls. This was due in part to the excellent representatives of our survey samples. For example, on race our survey and census measures correlated at a very sizable 0.948.

Our census information also afforded us an independent measure of physical environment: the proportion of all housing units that were vacant at the time of the 1980 census. Although this measure included units habitable but not currently occupied, as well as boarded-up vacant units unfit for habitation, it is probably safe to assume that lower-quality housing is more likely to be unoccupied. The average vacancy rate was 7.1% (SD = 7.1%). Percent vacant correlated with our decay measure at a strong 0.64.

RESULTS

Logic of Analysis

Our analysis was carried out as follows. First we examined the zero-order correlations between physical environment, SES, crime, and neighborhood sentiments. Then we went on to try and predict neighborhood sentiments, allowing crime and physical environment variables to enter after SES, in hierarchical regressions. To obtain an acceptable level of power (>80%) for large-size effects, given our number of cases, we set alpha at $p < 0.10$. After we carried out the regressions, we then tried to predict the physical parameters using SES variables in an effort to see how much total overlap there was between these two measures. Finally we investigated our hypothesis regarding conditional impacts by looking at only moderate-income neighborhoods, excluding high- and low-income areas. Zero-order correlations between decay and sentiments were examined, as well as second-order partials controlling for income and percent homeownership.

Zero-Order Correlations

The zero-order correlations of our physical parameters with the survey-based SES variables and crime appear in Table 2. The first point of interest is that our physical measures correlated "as they should" with crime. In line with Hunter's thesis (1978), neighborhoods with more decay also had higher crime rates (0.638), suggesting that both physical decay and crime may be a reflection of social disorganization, as Hunter has proposed, and as human ecologists before him have also suggested (see Taylor, in press). Also, neighborhoods with more nonresidential land use had higher crime rates (0.377), as Jacobs (1961) and other planners and sociologists (Suttles, 1968) have discussed. Nonresidential land use can be a "hole" in the fabric of local resident-based control. Neighborhoods with higher vacancy rates also had more crime (0.754).

TABLE 2. Zero-Order Correlations of Physical Variables with SES and Crime[a]

Physical Variables	Proportion black	Proportion renters	Educational level	Income level	Crime
Decay	0.402	0.590	−0.358	−0.534	0.638
Nonresidential land use	0.037	0.433	0.016	−0.284	0.377
Percent vacancies	0.348	0.554	−0.181	−0.429	0.754

[a]A total of 66 neighborhoods were surveyed. Correlations greater than ± 0.250 are significant at the 0.05 level; correlations greater than ± 0.325 are significant at the 0.01 level, and correlations greater than ± 0.408 are significant at the 0.001 level.

As expected, the physical parameters correlated strongly with the SES of neighborhood population. Higher scores on the decay factor were found in neighborhoods with a higher proportion of Black residents (0.402) and renters (0.590). Neighborhoods with less-educated populations (−0.358) and lower-income populations (−0.534) also had higher decay scores. Percent vacant housing stock was likewise strongly linked to the same SES variables. Percent nonresidential land use was higher in neighborhoods with a higher proportion of rental households, and higher in lower-income neighborhoods. Thus, physical parameters were strongly linked to several aspects of the SES of the neighborhood population. How to interpret this linkage is, of course, exceedingly difficult. Whether it reflects discrimination, or large-scale "sorting" of urban communities driven by areal-level social and economic forces, or whether it reflects some other process, it not clear and cannot be answered by our data. Nonetheless the important point here is that linkages exist and are in the direction one would expect.

Predicting Perception of Physical Problems

We first sought to see if physical deterioration contributed to the perception of physical problems. This relationship is important on two counts. First, it would seem to be important to establish that neighborhood populations perceive the physical problems that are around them. If this is not the case, then one must wonder if the wrong aspects, from the residents' point of view, of the physical environment have been measured. Thus, actual physical deterioration should contribute to perception of physical problems. Second, perception of physical problems has been the physical environment measure used in many previous studies (e.g., Skogan and Maxfield, 1981). Thus, it is important to see how perception of physical problems performs in this study before we go on to assessing the impacts of objective physical environment characteristics on local sentiments.

Four z-scored environmental problem items were added up to form a scale (alpha = 0.92). For each of the four items respondents indicated if they thought that problem was not a problem, was somewhat of a problem, or was a big problem in their neighborhood. The four problems were vacant houses, unkempt yards and properties, litter and trash, and vacant lots.

The physical problems correlated in the expected direction with the SES variables and crime. Neighborhoods with higher scores had a higher proportion of Black respondents ($r = 0.39$), renters ($r = 0.67$), and less-educated ($r = -0.35$) and lower-income ($r = -0.67$) respondents. Neighborhoods with more perceived physical problems also had higher crime rates ($r = 0.55$).

Perhaps more importantly, perception of physical problems correlated with actual physical problems, as measured by the decay factor ($r = 0.62$). Perception of physical problems also correlated with the nonresidential land use factor; neighborhoods with a greater proportion of nonresidential land use had residents who perceived more physical problems ($r = 0.28$).

The results of our hierarchical regression predicting perception of physical problems appear in Table 3. Variables were allowed to enter if they resulted in a significant addition ($p < 0.10$) to explained variance. The SES variables were entered first, crime second, and physical variables last. On the cluster of physical variables, our street assessments were entered before the vacant-housing measure based on census information.

Two SES variables, income level and proportion of renters, each contributed significantly to explained variation, together explaining almost 56% of variation in perception of physical problems. Crime rate, however, did not contribute uniquely to explaining perception of physical problems. Physical decay, added next, explained a significant ($p < 0.05$) additional 4% of the outcome, and percent of vacant houses, added last, explained a significant ($p < 0.05$) additional 3.5% of the outcome; thus, altogether, these two physical variables explained almost 8% of the neighborhood-level physical variation of perceived physical problems.

What is interesting is that although the physical measures made a significant contribution, it was not as sizable as one might have expected, especially since the zero-order correlation between perceived and objective physical problems was so high (>0.60). Where did this covariation go? We can get a clue by examining the partial correlation between perceived and objective physical problems and noting how the correlation shifted as the SES variables were entered. When income was entered on the first step, the objective-perceived partial was 0.42 ($p < 0.001$). The shared variance was roughly halved, dropping from 39% to 18%. Thus, half of the shared variation of perceived and objective physical problems was due to income. (We shall discuss later how to interpret this "spurious" correlation.) When the proportion of renters was added the partial dropped to 0.30; shared variation (9%) was halved again, standing at about one-quarter of the zero-order covariation. Thus, these two SES factors accounted for roughly three-quarters of the covariation of perceived and objective physical problems.

Fear

Although objective physical features correlated significantly with fear, this covariation was explained away by other factors. Our outcome was a six-item fear scale (alpha = 0.87) measuring how safe the respondent felt on his or her block, and in his or her neighborhood, during the day and at night. The fear scale also included two items concerned with perception of dangerous places and fear of retaliation. Three SES variables

TABLE 3. Predicting Perceived Physical Problems

Cluster	Variable	R^2 increment	Final beta
SES	Income	0.453^c	-0.34^b
	Proportion renters	0.105^c	0.24^a
Crime	—	—	—
Physical	Decay	0.041^a	0.14
	Vacancies	0.035^a	0.25^a

[a]Significant at less than the 0.05 level.
[b]Significant at less than the 0.01 level.
[c]Significant at less than the 0.001 level.

explained a signfiicant 52% of the variation in neighborhood fear levels. Neighborhoods with a higher proportion of renters (final beta = 0.40; $p < 0.001$), and Blacks (final beta = 0.23; $p < 0.05$), and with lower-income residents (final beta = -0.24; $p < 0.05$) had higher fear levels. Physical decay and crime did not merit entry in the fear regression. Again, we can examine the partial correlations between decay and fear at various steps in the regression to see where the covariation went. The zero-order covariation (27%) was reduced dramatically (to 5%) upon the entry of the first variable, proportion of renters. Thus, the link between physical decay and fear was largely "explained" by the fact that persons lived in predominantly rental neighborhoods were more fearful and lived in a physically more deteriorated context.

Attachment

All three physical parameters correlated very weakly ($r < 0.10$) with our measure of attachment.

Neighborhood Confidence

We developed a five-item scale (alpha = 0.904) assessing how people rated the neighborhood, as it was previously, as it was at present, and as they expected it to be in the future. Included in this scale were items where respondents rated the upkeep of the houses as if it was two or three years ago, indicated whether or not the appearance of the houses had improved, and rated the overall quality of the neighborhood as it was two or three years ago, as it was at present, and as it would be in the future.

The results of the hierarchical regression appear in Table 4. Two SES variables, entered in the first cluster, explained 56% of the variation in neighborhood confidence. Higher-income neighborhoods, and neighborhoods with a smaller proportion of renters, gave their neighborhoods higher ratings. Crime did not enter, even though it had a significant zero-order ($r = 0.49$) link with confidence. Physical decay, entered on the last step, added a significant ($p < 0.10$) 2% explained variation. Also this contribution was significant, the final beta (-0.19) was much smaller than the zero-order correlation (-0.58) Again, we might ask, where did the covariation go? Again, we can look to the partial correlations as we step through the regression for an answer. When income was entered on the first step of the regression the first-order partial between physical decay and neighborhood confidence was -0.34, representing about 35% of the zero-order shared variance. In other words, about 65% of the covariation between decay and confidence was explained by the fact that higher-income neighborhoods had better physical quality

TABLE 4. Predicting Neighborhood Confidence

Cluster	Variable	R^2 increment	Final beta
SES	Income	0.492^c	0.437^c
	Proportion renters	0.073^b	-0.262^b
Crime	—	—	—
Physical	Decay	0.022^a	-0.192^a

[a]Significant at less than the 0.10 level.
[b]Significant at less than the 0.05 level.
[c]Significant at less than the 0.001 level.

and more optimistic residents. The second-order partial was -0.23, representing about 15% of the zero-order relationship. Thus, tenure mix explained about 20% of the zero-order covariation between physical decay and confidence.

Predicting the Physical Parameters

The results so far have been instances of disappearing relationships, where zero-order links between physical environment and outcomes have been explained away by SES variables. This result suggested that we should be able to do a good job of predicting the physical variables themselves simply using SES variables; our results appear in Table 5. (We used census variables for this exercise.) Three variables were able to explain about 63% of the variation in our physical decay parameter. Neighborhoods with more decay were neighborhoods with lower-income, less-educated, Black populations. Crime did not make an independent contribution to physical decay. Five variables were able to explain about 62% of the variation in vacancy rates. Crime did make a significant unique contribution to explaining this physical parameter, suggesting that crime made a neighborhood a less desirable place to live, at least when measured in market terms.

Testing a Model of Conditional Impacts

To examine conditional impacts we selected neighborhoods with a 1980 average income of between \$10,000 and \$18,000. There were 45 such neighborhoods. For this subset

TABLE 5. Predicting Physical Characteristics

Predicting decay		
Variable	R^2 increment	Final beta
Income level	0.500^d	-0.44^d
Proportion black	0.043^b	0.24^c
Proportion with high school education	0.104^d	-0.37^d

Adjusted total $R^2 = 0.630$ $F(3,62) = 35.19^d$

Predicting vacancies			
Variable	R^2 increment	Beta before crime added	Final beta
Income	0.362^d	-0.22^a	-0.12
Black	0.03^a	0.18^a	-0.02
Education	0.106^d	-0.34^d	-0.17^a
Owners (%)	0.026^a	-0.22^a	-0.15
Crime	0.125^d	—	0.52^d

Adjusted total $R^2 = 0.620$ $F(5, 60) = 19.58^d$

$^a p < 0.10$.
$^b p < 0.05$.
$^c p < 0.01$.
$^d p < 0.001$.

the zero-order links between decay and sentiments were very strong. Decay correlated 0.425 ($p < 0.01$) with perception of physical problems, 0.419 ($p < 0.01$) with fear, and -0.448 ($p < 0.01$) with neighborhood confidence. Examination of the bivariate scatterplots showed that the relationships were quite linear. (We also selected two more restricted ranges of moderate-income neighborhoods, \$11,000–\$17,000 and \$12,000–\$16,000 average income, respectively, and obtained similar patterns of significant, linear relationships.)

When we controlled for both income and percent homeownership, the correlations were diminished somewhat, but were still strong, particularly when we considered the low statistical power stemming from our reduced number of cases. Decay correlated 0.225 ($p < 0.10$) with perception of physical problems, 0.322 ($p < 0.05$) with fear, and -0.266 ($p < 0.05$) with neighborhood confidence.

These second-order partials carried about 50% of the covariation carried in the zero-order correlations and provided very strong support of our contextual hypothesis. In moderate-income neighborhoods residents appeared to be very sensitive to the incidence of decay, and this physical parameter thus had a strong impact on how they felt about their locale. What this suggests is that physical environment features are filtered by residents, based on what they know about the surrounding context. In cases where matters of dilapidation and littering could be a product of resident behavior, residents viewed such deterioration as a serious threat to themselves and the neighborhood. We have suggested that this is the case in moderate-income neighborhoods where there is a mix of renters and owners. In low-income neighborhoods residents are more likely to view such lack of upkeep as structural, i.e., due to landlords who do not care and/or city agencies who will not enforce housing codes. Residents may also contribute to the problem, but the size of their contribution is likely to be viewed as paltry in comparison to other causes of decay. In high-income neighborhoods incidences of physical decay are relatively rare and are thus not a source of concern; their low incidence does not threaten the long-term security of the neighborhood. Of course, although our data support the above filtering interpretation, more extensive work on how neighborhood residents perceive and interpret local environmental features is needed to secure such an interpretation.

DISCUSSION

Our results are summarized in Table 6. For each of four outcomes we considered whether or not the data supported the model. We referred to two models. The full model included all neighborhoods, regardless of the social class of their residents. The conditional model included only moderate income neighborhoods. What we saw with regard to each of the outcomes was as follows. Fear of crime in the full model was not linked to physical decay after we controlled for social class. But in the conditional model fear and physical decay were linked, after controlling for SES. Attachment was not linked to physical parameters in either the full or conditional model. Neighborhood confidence was linked to environment in both models after partialling, but the partial was stronger in the conditional model. Perception of physical problems was linked, at the zero-order, and after partialling, in both the full and conditional models. In sum, links between local sentiment and physical decay, net of social class, are more clear-cut if we examine only moderate-income neighborhoods.

Perhaps one of the most important points to be gleaned from our study is that theoretically meaningful and reliable assessments of neighborhood physical environments can

TABLE 6. Summary of Results[a]

	Full model		Conditional model	
Outcome	Zero order	After partialling	Zero order	After partialling
Fear of crime	Yes	No	Yes	Yes
Confidence	Yes	Yes (weak)	Yes	Yes
Attachment	No	—	No	—
Physical problems	Yes	Yes	Yes	Yes

[a]Results indicated whether or not results supported the full or conditional model and if the each model was supported after partialling out socioeconomic characteristics

be carried out. We were able to develop a rating protocol that raters could use reliably, and which allowed them to move fairly swiftly over the blocks. The results yielded scales with very good levels of internal consistency. Perhaps even more importantly, the resulting dimensions corresponded very well with theoretical constructs discussed in the literature. Thus, in this sense, our study was a success.

The study was a success in a second sense as well. The constructs derived from our assessments correlated very well with the outcomes of interest: perceived physical problems, fear, and neighborhood confidence. These correlations were not only significant, but also of very good size, even by the standards of ecological correlations.

Our study yielded surprising results, however, once we had controlled for the SES characteristics of neighborhood populations. In the full model, regressions and the examination of the partials indicated that the links between physical environment and fear, and between physical environment and confidence, were largely explained away by SES factors, although physical decay still played a role in predicting confidence levels. In the fear regression, the zero-order decay–fear link was largely due to tenure mix, and in the confidence regression the zero-order decay–confidence link was largely due to income levels. What this means, in both these cases, is that a third SES variable was determining, to a sizable degree, both neighborhood decay levels, and local sentiments. What are the implications of this finding?

In one sense the above finding is quite expected. Basically, this finding means that the position of a neighborhood in the larger metropolitan status hierarchy determines what kind of people live there and the kind of physical environment they live in. Whether physical deterioration should be largely attributed to lack of municipal services, or to residents who care less about where they live, or to the higher maintenance levels required in denser, older settlements, is not clear. What is clear is that lower-SES populations live in more deteriorated, abused physical environments. At the same time these lower-SES populations are more fearful because they live in a more stressful and less predictable context, and they are also more pessimistic about the overall quality of their area. Thus, the congruence between physical context and population status, and the fact that low-SES persons have good reason to be concerned about where they live, when put together can explain away the decay–sentiments links.

The above findings of the full model were unexpected from the viewpoints of the theories we have been discussing. The incivilities thesis suggests that physical parameters make an independent contribution to fear levels. Attachment and satisfaction models also predict that physical parameters will make an independent contribution to local sentiments. Both of these models did not hold up at the neighborhood level. Our analysis represented the first neighborhood-level test of these models using objective physical data. By implication then, should we ignore physical environment parameters if we are concerned about improving how people feel about their neighborhood? Should we give up because it is all due to social class? The answer to this is an emphatic denial.

Our analysis of moderate-income neighborhoods has shown that physical parameters are very important for these types of neighborhoods. It appears to be the case that in neighborhoods where SES is neither so high as to guarantee confidence, nor so low as to guarantee pessimism, a good or bad physical environment has a crucial impact on how people view the neighborhood.

Following the line of reasoning outlined above, it may make most sense for planners to concentrate on physical improvements in neighborhoods in the low-to-moderate SES category, such as blue-collar neighborhoods or neighborhoods with a significant volume of homeownership (>30%) as well as renters (>30%). It may be in these neighborhoods that physical improvement has significant impacts. A second practical implication is that planners should not expect that, in low-SES areas, amelioration of physical problems will result in drastically improved levels of optimism and confidence and drastically lowered fear levels. Although such physical improvements may help somewhat, they cannot negate the significant volume of social problems stemming in large part from the nature of the population and the deprivations they experience, such as unemployment. In short, planners should not expect physical improvements to completely turn neighborhood attitudes around. Rather, what these results show is that an attack on physical problems in a locale should always be part and parcel of a social program, and that the former should never be substituted for the latter.

On a theoretical note, our results suggest that a theory merging sociologic and psychologic considerations may be warranted to understand why the moderate-income neighborhoods we focused on were so negatively impacted by the condition of the local physical environment. We have suggested that various attribution processes might have been at work such that in high- and low-income neighborhoods the causes of deterioration were discounted. Work that would investigate these psychologic processes, nested with a sociologic understanding of neighborhood sentiment and change, would be most welcome.

This research was carried out under a grant from the National Institute of Justice (80-IJ-CX-0077) to the Johns Hopkins Center for Metropolitan Planning and Research.

REFERENCES

Choldin HM (1978) Social life and the physical environment. In D Street (Ed.), *Handbook of Contemporary Life*. San Francisco: Jossey-Bass Publications.

Dunlap RE, Catton WR (1979) Environmental sociology. *Annual Review of Sociology* 5:243–273.

Dunlap RE, Catton WR (1983) What environmental sociologists have in common. *Sociological Inquiry* 53:113–135.

Fisher JD, Bell PA, Baum A (1984) *Environmental Psychology*. New York: Holt, Rhinehart & Winston.

Fried M (1982) Residential attachment: Sources of residential and community satisfaction. *Journal of Social Issues* 38:107–119.

Goodman AC, Taylor RB (1983) *The Baltimore Neighborhood Fact Book*. Baltimore, MD: The Johns Hopkins University, Center for Metropolitan Planning and Research.

Greenberg SW, Rohe WM, Williams JR (1982) Safety in urban neighborhoods. *Population and Environment* 5:141–165.

Holohan CJ (1982) *Environmental Psychology*. New York: Random House.

Hunter A (1978) *Symbols of incivility*. Paper presented at the Annual Meeting of the American Society of Criminology, Dallas, TX.

Jacobs J (1961) *The Death and Life of Great American Cities*. New York: Vintage.

Michelson W (1970) *Man and his Urban Environment*. Reading, MA: Addison-Wesley.

Shumaker SA, Taylor RB (1983) Toward a clarification of people–place relationships: A model of attachment to place. In N Feimer and ES Geller (Eds.), *Environmental Psychology: Directions and Perspectives*. New York: Praeger.

Skogan W, Maxfield MG (1981) *Coping with Crime*. Beverly Hills, CA: Sage.

Stokols D (1977) Origins and direction of environment–behavior research. In D Stokols (Ed.), *Perspectives on Environment and Behavior*. New York: Plenum.

Suttles GD (1968) *The Social Order of the Slum*. Chicago: University of Chicago Press.

Taylor RB (1982) The Neighborhood physical environment and stress. In GW Evans (Ed.), *Environmental Stress*. New York: Cambridge University Press.

Taylor RB (in press) Toward an environmental psychology of disorder. In D Stokols and I Altman (Eds.), *Handbook of Environmental Psychology*. New York: Wiley.

Taylor RB, Brower S, Drain W (1979) *A Map of Baltimore Neighborhoods*. Baltimore, MD: The Johns Hopkins University, Center for Metropolitan Planning and Research.

Taylor RB, Gottfredson SD, Shumaker SA (1984) *Neighborhood responses to disorder*. Unpublished final report, The Johns Hopkins University, Center for Metropolitan Planning and Research.