Physical Environment Correlates of Psychosocial Health Among Urban Residents[1]

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This study examines the hypothesis that the psychosocial health of urban dwellers is related to characteristics of the physical environment in which they reside. For each of 100 Atlanta city blocks, 21 indices of deviant psychosocial behavior were obtained, as were 104 physical environment indices (such as landscaping and nearby land use), and 106 sociocultural environment indices (such as population density and income). Factor analysis was used to define relatively independent variables measuring both the physical and sociocultural environment, and regression analysis was used to establish associations of these variables with the indices of psychosocial health. Results indicate that characteristics of the physical environment are about as important as characteristics of the sociocultural environment in explaining variation in psychosocial health.

Many studies have confirmed the relationship between the sociocultural environment and the psychosocial health of people residing therein. Two distinct

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research methodologies have been used, the unit of measurement being either the individual person (e.g., Hollingshead & Redlich, 1958; Leighton, Harding, Macklin, Macmillan, & Leighton, 1963; Srole, Langner, Stanley, Opter, & Rennie, 1962) or the geographic area (e.g., Bloom, 1966, 1968; Cartwright & Howard, 1966; Kraus, 1975; Stack, 1975). The latter method, often called the ecological method, has been criticized (e.g., by Dohrenwend, 1966) because significant ecological correlation coefficients may not hold between similar variables when the unit of measurement is an individual person. Bloom (1968) suggests that it may be appropriate to extrapolate correlational relationships based on geographic areas to individuals for such purposes as estimating the need for and use of community-based primary prevention activities in mental health (Bloom, 1973), where the estimates are for the community and not for specific individuals.

These studies have used a variety of measures for the psychosocial health (or illness) of the person or community. Studies of individuals have used self-administered psychological scales (Catalano & Dooley, 1976; Srole et al., 1962), records of hospitals or private practitioners (Hollingshead & Redlich, 1958; Leighton et al., 1963), or personal interviews. Ecological studies have used juvenile delinquency rates (Cartwright & Howard, 1966; Kraus, 1975), first admission rates to psychiatric hospitals (Stack, 1975; Bloom, 1968; Brenner, 1969, 1973), or a collection of social disequilibrium measures (Bloom, 1966) including divorce rate, rate of children in single-parent households, unemployment rate, and crime and arrest rates.

Following the pioneering work in which Shaw and McKay (1942) showed delinquency rates in urban areas to be correlated with various neighborhood socioeconomic characteristics, sociologists have generally seen the explanation for differences in psychosocial health among urban areas as being tied to variation of opportunity in the struggle for position in the social order. Among many others, Cloward and Ohlin (1960) have followed this tradition in concluding that deviant behavior such as delinquency is a property of the social system.

Measures used for the sociocultural environment have stressed such indicators of socioeconomic status as occupation, education, income, and/or geographic residence (Hollingshead & Redlich, 1958); community cohesiveness or participation (Bloom, 1966; Leighton et al., 1963) and, especially for ecological studies, census tract characteristics. Common variables for which data can be assembled on a tract basis, whether from the census or other sources, include quality of housing and crowding (Stack, 1975; Bloom, 1966); income, education, occupation, and employment (Stack, 1975; Bloom, 1966); demographic characteristics such as age and sex distribution, fertility rate, and marriage rate (Bloom, 1968); and community health and health services indices such as tuberculosis rate or public health nursing visits (Bloom, 1966). Some variables, e.g., divorce rate, have been used in one study to measure community disruption (Bloom, 1966) and then in another study to measure the sociocultural environment (Bloom, 1968).

In recent years, study of the relationship of the environment to psychosocial health has been extended beyond sociocultural factors. Several studies emphasized economic aspects (Brenner, 1969, 1973; Catalano & Dooley, 1976). Dooley and Catalano (1977) suggest that economic factors can be used to predict anticipated increased demand for mental health services following a downturn in the economy, basically a reactive stance. Other community psychologists have sought guidance for direct primary prevention from relationships based on physical aspects of the environment (Moos, 1976; Monahan, 1975; Bloom, 1973; Wohlwill, 1970). For instance, Catalano and Monahan (1975) suggest that community psychologists participate in environmental impact assessment processes, although they and Imber, Young, and Froman (1978) note that psychologists have avoided this arena. As a consequence, the urban-planning profession has been left with minimal help as it daily makes decisions that shape the urban environment.

One reason community psychologists have not been very active in researching physical environment correlates of psychosocial health (Craik, 1973: Rubinstein & Coelho, 1970) may be the lack of emphasis given to physical environmental factors in their training programs (Aponte, 1974; Barton, Andrulis, Grove, & Aponte, 1976; Meyer & Gerrard, 1977). Efforts which have been made have used such factors as what people think about their physical environment (Altman, 1975; Carp, Zawadski, & Shokrkon, 1976), behavioral or attitudinal response to important environmental events (Craik, 1973), and interventions aimed at changing people's behavior toward their physical environment (Winett & Nietzel, 1975). However, a theoretical foundation built from hypotheses tested using empirical data on the physical environment and psychosocial health is needed if the discipline of community psychology is to have any basis for its involvement in the type of community intervention as recommended by Catalano and Monahan (1975).

As a contribution to this need, this paper presents an empirical exploration of the relationship between psychosocial health and components of the physical environment in one Southeastern U.S. city. By statistically controlling sociocultural aspects of the environment, the results indicate that physical aspects of the environment explain about as much variation in community psychosocial health as do sociocultural aspects. Though the results are not definitive nor generalizable to all cities, they are useful for suggesting future research and for contributing to the development of a needed conceptual framework in this area.

METHODOLOGY

Description of Geographic Area and Sample

The geographic area studied is the portion of Atlanta served by the mental health program of the Atlanta Southside Comprehensive Health Center (ASCHC).

The study area comprises 19 census tracts, 743 city blocks, and 6,640 acres. The population of 68,000 in 1970 was down from 89,000 in 1960. The 1970 population density for the study area was 10.2 per acre compared to 6.2 for the city as a whole. About 65% of the 1970 population was black, with most blocks being either predominately black or predominately white. The residential areas are lower to lower-middle income. Housing includes some of the worst slums in Atlanta, new single-family homes in both black and white neighborhoods, new apartment buildings, and rented rooms in commercial or industrial buildings. The landscape is varied, including heavily wooded areas; grassed areas with no trees; areas with a mixture of bare dirt, weeds, and half-dead trees; and paved areas around commercial or industrial establishments. The Atlanta Stadium and a city park containing the city zoo and a Civil War Cyclorama bring large numbers of outsiders into the study area.

The ecological method was chosen for this initial exploratory study because data collection is less expensive and the initial need placed greater emphasis on community than on individual problems. A simple random sample of 100 blocks was chosen for study from the universe of 743 blocks. In this process, 16 blocks were discarded from the original 743 because they were found to have no inhabitants. The populations of the 100 sample blocks ranged from 5 to 1,563, with a median value of 75 residents and with 25 blocks having fewer than 50 residents.

This study differs from many ecological studies in that a block, rather than a census tract, is used as the unit of analysis. The major reason is that a large number of physical environment variables were measured directly for this exploratory study, and it would not have been feasible to measure all these variables for a large number of geographic areas as widespread as a census tract. Furthermore, many of these physical environment variables vary widely from place to place within an area as large as a census tract. The disadvantage of using blocks, rather than census tracts, is that the number of residents per unit of analysis is less, resulting in more variability in the calculated rates or indices per block.

Selection and Measurement of Psychosocial Health Indices

Psychosocial health is evidenced on the positive side by achievements in the community and on the negative side by manifestations of socially deviant and other undesirable behavior. Most of the psychosocial health indices in this study are encounter rates between residents of a given sample block and some agency (e.g., health care unit, law enforcement agency, welfare department). Encounters during calendar year 1970 were obtained except for a few indices where the time period was varied slightly to match the record-keeping system of the agency.

A total of 22 psychosocial health indices were selected, including arrest rates for various offenses; mental health service utilization rates; high school

honor students (the only socially desirable index for which data could be obtained), dropouts, and absentee rates; welfare, child neglect, and infant mortality; court child supervision and juvenile delinquency rates; homicide involvements and violent deaths; fire and burglary victim rates and known drug problems. For each index, an annual rate was formed by dividing the 1970 block population into the number of 1970 encounters for that block. For some indices (e.g., robbery arrests) individuals with more than one encounter with the agency during the time period were counted more than once, since the rate attempts to measure agency case load. However, in those agencies where it is expected that clients will be seen again and again (welfare, mental health center, alcoholic treatment center), the number of encounters counted per block included only the number of different block residents seen by that agency.

The distributions of these 22 indices over the 100 blocks are skewed, especially when the encounter type is infrequent (e.g., homicide involvements and court child supervision). Seven additional well-being indices were defined as logical combinations of some of the original 22 indices, partially in an effort to reduce skewness; (a) total arrests, (b) total arrests plus juvenile delinquency,

Table I. Psychosocial Health Indices

Index no.	Description
1	Arrests (excluding juvenile, narcotics, robbery)
2	Juvenile arrests
3	Narcotics arrests
4	Robbery arrests
5	High school honor students
6	Homicide involvements
7	Burglary victims
8	Fires
9	Alcoholic patients
10	High school dropouts
11	Violent deaths
12	ASCHC Mental health patients
13	ASCHC Patients, mental and physical problems
14	Court child supervision
15	Child neglect and infant mortality
16	Juvenile delinquency
17	Known drug problems
18	Grady mental health outpatients
19	Chronic H.S. absenteeism, students
20	Chronic H.S. absenteeism, days
21	Mental health inpatients
22	Welfare families
23	Total arrests, sum of indices 1,2,3,4
24	Arrests plus juvenile delinquency, sum of indices 1,2,3,4,16
25	Mental health patients, sum of indices 12,13,18,21
26	Juvenile problems, sum of indices 2,10,16,19
27	Parent problems, sum of indices 14,15
28	Alcohol and drug problems, sum of indices, 3,9,7
29	Grand total, sum of all except 5 and 20

(c) mental health patients, (d) juvenile problems, (e) parent problems, (f) alcohol and drug problems, and (g) a grand total index combing 20 socially undesirable indices. Table I lists all 29 psychosocial indices.

Selection and Measurement of Physical Environment (PE) Indices

In keeping with the exploratory nature of this study, PE indices were defined in an attempt to capture attributes of the physical environment, both natural and manmade, that would plausibly add stress or satisfaction to the lives of the people living in that block. Field observations made on each sample block were limited to those features exterior to residences and observable while walking around the block perimeter. Maps, aerial photographs, or data already collected on the study area for other purposes were used when appropriate. The only instrumentation used was a noise meter. The procedures for making the required measurements for the indices were defined to produce results which would be as independent as possible of the particular individual sent into the field to gather the data, and the reproducibility was verified by making sure that each of the nine individuals who worked on the survey checked the measurements for other test blocks first.

Eleven broad components (listed below) of the exterior physical environment were specified, resulting in 104 indices to measure these components.

1. The visual characteristics of the exterior environment which are seen as a resident looks at the front yards of himself and his neighbors, across the street, and on to the skyline.

2. The level of maintenance of these exterior areas as manifested by well-kept shrubbery, neat landscaping, or the absence of litter, mudholes, and weeds.

3. The presence, visual characteristics, and spatial distribution of trees and other vegetation throughout the neighborhood.

4. The range in environmental attributes found in close proximity to the area where the resident lives; the degree of visual heterogeneity in the neighborhood.

5. Access and exposure to open space including vacant lots or parks and the esthetic and recreational quality of such areas.

6. The amount of vehicular and pedestrian traffic and vehicular parking in the neighborhood and the provisions made to accommodate them.

7. Neighborhood land use including residence type (single family, apartment, public housing, etc.), residential density, and other urban development (industrial, commercial, public areas, etc.).

8. Factors that work either to exclude or to attract outsiders into the area or otherwise increase or decrease the control an individual resident has over his own exterior environment.

9. Access of the inhabitants to desired services or facilities or proximity of their homes to undesirable or detracting environmental features.

10. Neighborhood topography, distance to the horizon, and position of a block between hilltop and streamside.

11. Intensity of neighborhood experiences with air, water, noise, or solid waste pollution.

A list of all 104 indices is in James, Brogan, Laurent, and Baltimore (1974).

Selection and Measurement of Sociocultural Environment (SE) Indices

Information for the sociocultural indices was obtained from the 1960 and 1970 U.S. Census of Population and Housing and from the 1970 Housing Survey conducted by the Atlanta Planning Department. Twelve components of sociocultural environment (listed below) were included, resulting in 88 original SE indices; 18 combined SE indices were defined as functions of some of the 88 original SE indices.

1. The size of blocks as measured by acreage and by population.

2. The density of population as measured by people per room, per residence, or per housing structure; the number of residences or housing structures per acre; and daytime density as affected by industrial or commerical uses or public attractions.

3. The racial background of the residents, the degree of racial integration in the neighborhood, and the extent to which both of these factors changed over the preceding decade.

4. The quality of the housing as indicated by neighborhood averages and ranges in price, age, building code compliance, and occupancy rates.

5. The control the resident has over his housing and living space as indicated by ownership, proximity of neighbors, and attractions bringing outsiders nearby.

6. Characteristics of the people living together in a residence with respect to group size, relationship of the head to the others, sex, and age.

7. The number, purposes, and quality of nonresidential buildings in the neighborhood.

8. The direction and time rate at which the block is changing as individuals move in and out and buildings are constructed or torn down.

9. Whether living conditions on a given block are better, representative of, or worse than conditions in the neighborhood.

10. The age distribution of people living on the block and in the neighborhood as a whole.

11. The educational and cultural background, occupation, and employment status of block residents and the extent to which job experiences take them into better or into worse living environments.

12. The incomes of the block residents both black and white, and how the income compares with neighborhood norms.

A list of all 106 SE indices is in James et al. (1974).

Some of the SE indices used in this study were not published by the Census Bureau for areal units smaller than census tracts. In this case, the index for a sample block was taken to be the index for the census tract to which it belonged.

DATA ANALYSIS

Reduction of Physical and Sociocultural Environment Indices

At this point, the number of indices in the SE and PE groups was reduced to 80 because (a) the available factor analysis computer program (Dixon, 1968) accepted a maximum of 80 variables, and (b) the number of variables analyzed should be fewer than the number of sample blocks. For the reduction process, each index in each set was intercorrelated and then correlated with the 29 psychosocial health indices. This enabled selection of 80 PE indices which were not highly correlated with each other and showed correlation with some of the 29 psychosocial health indices. Likewise, 80 SE indices were selected by a similar procedure. The 80 PE indices and 80 SE indices selected at this stage are listed in James et al. (1974).

Factor Analysis of Physical and Sociocultural Environment Indices

Principal component factor analysis was then applied separately to each of the two groups of 80 indices in order to reduce the large number of indices to a smaller number of factors which would be more manageable. Requiring an eigenvalue of at least 1.00 resulted in a rotation of 25 PE factors accounting for 80% of the total variance. The three indices with the strongest loadings on each factors are in James et al. (1974).

Requiring an eigenvalue of at least 1.00 resulted in rotation of 18 SE factors, accounting for 85% of the total variance. The three indices with the strongest loadings on each factor are in James et al. (1974).

The widely used method of calculating a factor score as a linear combination of all variables loading significantly on that factor was not used because any follow-up studies using such factors would have needed to measure a large number of indices in order to determine just one factor score. Hence, only one index was selected to represent each factor, according to the following procedure. For each factor a list was made of indices whose squared loading exceeded half of the square of the maximum loading of any index on that factor. From this list one index was chosen on the basis of association with the greatest number of psychosocial indices. The index chosen to represent a factor is called a factor index. The 25 PE factor indices and 18 SE factor indices so selected are in Table II.

Table II. Factor Indices for Physical and Sociocultural Environment

Factor index no.	Physical environment	Factor index no.	Sociocultural environment
1	Percentage of front yards which is dirt	1	Percentage of families with income below poverty level
2	Tenths of mile to nearest public transportation	2	Percentage of males unemployed
3	Percentage of streets with holes	3	Median rent as percentage of income for poor — census tract data
4	Percentage of land within ¼ mile used for light industry/warehouses		
5	Percentage of block area covered in trees	4	Population per frontage mile
6	Diversity in scattered trees in front yards	5	Block area in acres
7	Percentage of front yards which contain abundant maintained trees	6	Percentage of housing units with furnace — census tract data
8	Percentage of blockface crossing creek	7	Average number persons per room
9	Percentage of land used for commercial	8	Percentage of units which are rented
10	Percentage of front yards with no trees	9	Percentage of population in professional or managerial occupations — census tract data
11	Percentage of front yards with cars in yard		
12	Percentage of block area in parks	10	Percentage among 16-21 years not in school nor high school graduates — census tract data
13	Percentage of block borders with dirt/gravel sidewalks		
14	Percentage of across street open space which is unkempt vacant lots	11	Percentage of structures with 10 or more family units
15	Percentage of block borders which are unpaved streets	12	Ratio of average value of home on block to average value of home in census tract
16	Percentage of blockfaces with detracting natural vistas	13	Percentage of structures which are commercial
17	Percentage of block area in maintained parks	14	Increase in percentage of black persons on block from 1960 to 1970
18	Percentage of land across street in open dumps		
19	Percentage of block borders which are dead-end streets	15	Percentage of land parcels which are vacant
		16	Percentage of residences which are dilapidated
20	Percentage of yards which are fenced		
21	Number of crosswalks per blockface	17	Percentage of public structures which are substandard
22	Percentage of block borders with sidewalks needing repair		
23	Percentage of front yards with vegetable gardens	18	Whether or not block is in service area of ASCHC
24	Average morning noise in decibels		
25	Percentage of block land in public use		

These 43 factor indices are the independent variables used in the subsequent regression analyses.

Testing the Significance of the Physical Environment Factor Indices

Regression Analysis Controlling on SE Factor Indices. Multiple regression analysis was used separately on each psychosocial health index to assess whether the PE factor indices explained some of the variation in the psychosocial health index, after controlling statistically on the SE factor indices. The following procedure was used.

First, each psychosocial health index was regressed only on the 18 SE factor indices, allowing these independent variables to sequentially enter the regression equation if the "F to enter" criterion exceeded one (Dixon, 1968). The average number of SE factor indices to enter the regression equations for the 29 psychosocial health indices was 6.1, with a range of 2 to 12. The multiple R^2 for each psychosocial health index, using only the SE factor indices meeting the F-to-enter criterion, is given in column 2 of Table III. These multiple R^2s range from .04 (for the combined index for alcohol and drug problems) to .53 (for violent deaths).

Second, for each psychosocial health index, the SE factor indices selected from the first step above were forced into the regression equation. Then, additional independent variables were selected sequentially for the equation from the 25 PE factor indices, including those variables with an F to enter exceeding one. The multiple R^2, including all of the SE and PE variables so selected, is shown in column 3 of Table III. Every one of the values of R^2 is seen to be increased by adding the PE factor indices. Increases ranged from .04 (.17 to .21 for high school dropouts) to .40 (.09 to .49 for known drug problems). Although some multiple R^2s increased much more than others, it is clear that the PE factor indices *do* explain some of the variation in the psychosocial indices.

Regression Analysis Without Controlling on SE Factor Indices. A second stepwise multiple regression analysis was done for each psychosocial health index, allowing the 43 PE and SE factor indices to enter the regression equation in their order of importance, as long as the F criterion exceeded unity. Each factor index in each equation was assessed for its contribution to the multiple R^2, i.e., the amount the multiple R^2 was increased by adding this factor index to the regression equation. The sum of all contributions to R^2 from the SE factor indices is given in column 4 of Table III, and the number of SE factor indices in the regression equation is given in column 5. Likewise, the contribution to the multiple R^2 of the PE factor indices is given in column 6 and the number of PE factor indices in the regression equation is in column 7. The sum of columns 4 and 6 of Table II yields the multiple R^2 for each regression equation in this analysis, and the sum of columns 5 and 7 gives the total number of variables in the regression equation.

Table III. Multiple R^2 Due to SE and PE Indices for Each Psychosocial Health Index

Psychosocial index no. (1)	R^2-SE indices only[a] (2)	R^2-PE added to SE indices[b] (3)	Stepwise SE and PE Indices[c]				Fraction of explained variation due to PE (8)	Fraction of vars. which are PE (9)
			R^2-SE (4)	no. vars. (5)	R^2-PE (6)	no. vars. (7)		
1	.28	.45	.24	5	.21	8	.47	.62
2	.23	.33	.15	6	.18	7	.55	.54
3	.10	.35	.08	6	.27	9	.77	.60
4	.30	.43	.30	8	.13	7	.30	.47
5	.18	.46	.11	5	.35	10	.76	.67
6	.29	.46	.28	7	.18	13	.39	.65
7	.21	.36	.17	2	.19	7	.53	.78
8	.28	.39	.10	5	.29	6	.75	.55
9	.20	.40	.21	5	.19	8	.48	.62
10	.17	.21	.15	5	.06	3	.29	.38
11	.53	.70	.53	12	.17	7	.24	.37
12	.14	.47	.20	8	.27	12	.58	.60
13	.27	.40	.28	4	.12	6	.30	.60
14	.26	.64	.18	8	.46	6	.72	.43
15	.17	.31	.17	8	.14	7	.45	.47
16	.37	.62	.38	11	.24	13	.39	.54
17	.09	.49	.08	7	.41	8	.84	.53
18	.22	.38	.17	4	.21	8	.55	.67
19	.23	.46	.22	5	.24	13	.52	.72
20	.28	.48	.26	6	.22	9	.46	.60
21	.15	.35	.09	5	.26	10	.74	.67
22	.30	.48	.27	8	.21	8	.44	.50
23	.18	.40	.17	5	.23	10	.58	.67
24	.30	.46	.27	5	.19	10	.41	.67
25	.33	.40	.30	4	.10	4	.25	.50
26	.28	.57	.29	9	.28	13	.49	.59
27	.22	.30	.19	6	.11	4	.37	.40
28	.04	.30	.08	4	.22	5	.73	.56
29	.27	.45	.25	5	.20	8	.44	.62

[a] Allowing only SE indices to enter regression equation.
[b] Allowing PE indices to enter equation after SE indices already in equation.
[c] Allowing PE indices and SE indices into regression equation in any order.

The results with these two regression procedures were quite similar. First, the two procedures produced almost the identical multiple R^2 for any given psychosocial heatlh index, as can be seen by adding columns 4 and 6 and comparing that total to column 3 in Table III. Second, the two procedures chose nearly identical sets of PE and SE factor indices for a given psychosocial health index. Since either method would show about the same relative contribution of the PE factor indices, subsequent discussion uses results from the regression analysis without controlling on the SE factor indices, i.e., columns 4 thru 7 of Table III.

Relative Contribution of PE Factor Indices. The average number of PE and SE factor indices in the regression equations for the psychosocial health indices is 8.2 and 6.1, respectively. Hence, the number of PE and SE factor indices chosen for the regression equations is similar. Column 9 in Table III gives the fraction of chosen factor indices which are PE variables, and the average fraction is .57.

Over the 29 psychosocial health indices, an average of .21 of the variation is explained by SE factor indices, .22 by PE factor indices, and .57 of the variation remains unexplained. Hence, on the average, PE factor indices explain about as much variation as SE factor indices. For each psychosocial

Table IV. Characterizations of Physical Environments Associated with Each Psychosocial Index

No.	Index	Environmental characterization
1	Arrests	Regular intermingling with strangers
2	Juvenile arrests	Recreational opportunities attracting young people
3	Narcotic arrests	Gardens, parks, and woodlands
4	Robbery arrests	Opportunities for concealment
5	High school honor students	Attractive homes maintained in adverse circumstances
6	Homicide involvements	Strong social stress
7	Burglary victims	Outward appearance of prosperity
8	Fires	Large open areas
9	Alcoholic patients	Rooming houses
10	High school dropouts	Environmentally better neighborhoods
11	Violent deaths	Structural and general environmental deterioration
12	ASCHC mental health patients	Congestion and noise
13	ASCHC, mental and physical problems	Apartments subdivided from larger older homes
14	Court child supervision	Marginal commercial establishment
15	Child neglect and infant mortality	Better homes in deteriorating neighborhoods
16	Juvenile delinquency	Many nearby commercial establishments
17	Known drug problems	Open areas and gardens
18	Grady mental health outpatients	Racial change
19,20	Chronic high school absenteeism	Old black residential neighborhoods
21	Mental health inpatients	Small buildings with few public services
22	Welfare families	Poor but not the worst neighborhoods

Table V. Number of Positive and Negative Associations and Average F to Enter for Each PE Factor Index with Individual Psychosocial Indices[a]

PE Factor index		Positive associations		Negative associations	
No.	Brief description	n	Average F to enter[b]	n	Average F to enter
1	Dirt ground cover	3	4.9	6	4.6
2	Public transportation	2	5.4	2	4.8
3	Holes in street	4	5.3	2	4.2
4	Light industry	1	5.3	7	4.5
5	Tree cover	2	4.0	4	5.8
6	Tree diversity	1	5.6	6	4.0
7	Trees front yard	8	4.2	1	2.2
8	Proximity to streams	1	2.0	1	1.6
9	Commercial use	5	11.8	2	5.2
10	No trees front yard	3	3.2	3	3.8
11	Cars in yard	8	5.1	1	2.4
12	Parks	5	7.1	3	2.8
13	Dirt/gravel sidewalks	0	—	5	2.9
14	Unkempt vacant lots	1	2.4	2	2.8
15	Unpaved streets	1	1.4	11	2.5
16	Detracting natural vistas	1	4.0	4	3.0
17	Maintained parks	4	4.3	5	2.6
18	Open dumps	3	3.2	6	3.7
19	Dead-end streets	0	—	6	6.9
20	Fenced yards	3	2.0	7	2.8
21	Marked crosswalks	3	2.1	4	4.7
22	Unrepaired sidewalks	2	4.0	4	2.1
23	Vegetable gardens	5	8.9	0	—
24	Noise	5	4.8	3	3.2
25	Public use	8	13.1	1	1.1

[a] High school honor students not included among the 22 psychosocial indices for this table.
[b] Mean value of the F to enter from the regression equations in which the PE factor index was selected as an independent variable.

health index, the percent of explained variation which is due to PE factor indices is given in column 8 of Table III (column 8 is the sum of columns 4 and 6 divided into column 6). This percentage ranges from .24 for violent deaths (no. 11) to .84 for drug problems (No. 17), and the average is .51.

The particular SE and PE factor indices chosen to be in the multiple regression equation for each psychosocial health index are listed in James et al. (1974). Table IV summarizes the most important characteristics of the physical environment for each psychosocial health index and shows wide variation in the physical environments associated with blocks with different problems.

Table V indicates the number of times a PE factor index was associated with each of the 21 individual indices of psychosocial deviance. It also divides these factor indices between those with a direct (positive) relationship and those with an inverse (negative) relationship. Further, in an effort to present a sense of the magnitude or strength of the relationships, the mean value of the F to enter statistics are also presented. The complexity of the associations contained within the data can be seen from the fact that 18 of the 25 environ-

mental indices have direct (positive) ties with some indices of psychosocial deviancy and inverse (negative) ties with others.

These results give sufficient evidence of relationships between the physical environment and psychosocial heatlh to warrant further study. As a result of their number and diversity, some of the physical environment indices may have been found in this study to be associated with one or more psychosocial health indices by chance. However, the number of associations between psychosocial health and the physical environment is too large for chance to be a general explanation.

DISCUSSION

The data collected in Atlanta and the above analyses show that physical environment indices have approximately the same degree of association with the psychosocial health of urban residents as do sociocultural environment indices. Furthermore, the analyses show that the physical environment indices have more association with some psychosocial health indices than they do with others. Also, the specific environment indices, whether physical or sociocultural, which are most closely associated with psychosocial health vary greatly among the various psychosocial health indices.

These results lead to two questions. First, why are these patterns so? Second, what use can be made of this sort of information? The answer to the first question requires hypotheses of causal relationships and the collection of suitable information for hypothesis testing. Perhaps the physical environmental indices are simply manifestations of social position in the tradition of Shaw and McKay (1942), or perhaps they tie to the frustration of important human environmental needs of other sorts. Whichever the case, the relationships outlined in this paper and in more detail in James et al. (1974) provide a wealth of empirical data useful in proposing promising hypotheses, but any theoretical framework on the basis of the information at hand would be pure speculation.

As to the second question, any relationship once established could be used to estimate probable levels of various encounter problems and facility needs for dealing with them. A very important additional point is that the physical environment in urban areas is largely shaped by decisions being made by the urban-planning profession, and these decisions are now being made in ignorance of whatever effects, for better or for worse, they may have on the psychosocial health of the people who live in the environments created. Urban planners need help from community psychologists and are hoping for a research thrust that will provide it.

REFERENCES

Altman, I. An eclectic approach. *Contemporary Psychology,* 1976, *21,* 106-108.

Aponte, J. F. In search of an educational model for community psychology. *Journal of Community Psychology,* 1974, *2,* 301-305.

Barton, A. K., Andrulis, D. P., Grove, W. P., & Aponte, J. F. A look at community psychology training programs in the seventies. *American Journal of Community Psychology,* 1976, *4,* 1-11.

Bloom, B. L. A census tract analysis of socially deviant behaviors. *Multivariate Behavioral Research,* 1966, *1,* 307-320.

Bloom, B. L. An ecological analysis of psychiatric hospitalizations. *Multivariate Behavioral Research,* 1968, *3,* 423-464.

Bloom, B. L. The domain of community psychology. *American Journal of Community Psychology,* 1973, *1,* 8-11.

Brenner, M. H. Patterns of psychiatric hospitalization among different socioeconomic groups in response to stress. *Journal of Nervous and Mental Disorders,* 1969, *148,* 31-38.

Brenner, M. H. *Mental illness and the economy.* Cambridge: Harvard University Press, 1973.

Carp, F. M., Zawadski, R. T., & Shokrkon, H. Dimensions of urban environmental quality. *Environment and Behavior,* 1976, *8,* 239-264.

Cartwright, D. S., & Howard, K. I. Multivariate analysis of gang delinquency: 1. Ecologic influences. *Multivariate Behavioral Research,* 1966, *1,* 321-371.

Catalano, R., & Dooley, D. Economic predictors of depressed mood and stressful life events in a metropolitan community. *Journal of Health and Social Behavior,* 1977, *18,* 292-307.

Catalano, R., & Monahan, J. The community psychologist as social planner: Designing optimal environments. *American Journal of Community Psychology,* 1975, *3,* 327-334.

Cloward, R. A., & Ohlin, L. E. *Delinquency and opportunity: A theory of delinquent gangs.* Glencoe, Ill.: Free Press, 1960.

Craik, K. Environmental psychology. *Annual Review of Psychology,* 1973, *24,* 403.

Dixon, W. J. (ed.). *BMD Biomedical computer programs.* Berkeley: University of California Press, 1968.

Dohrenwend, B. P. Social status and psychological disorder: An issue of substance and an issue of method. *American Sociological Review,* 1966, *31,* 14-34.

Dooley, C. A., & Catalano, R. A. Money and mental disorder: Toward behavioral cost accounting for primary prevention. *American Journal of Community Psychology,* 1977, *5,* 217-227.

Hollingshead, A. B., & Redlich, F. C. *Social class and mental illness.* New York: Wiley, 1958.

Imber, S., Young C., & Froman, L. Public psychology: An extension of the community idea. *American Journal of Community Psychology,* 1978, *6,* 71-80.

James, L. D., Brogan, D. R., Laurent, E. A., & Baltimore, H. E. *Community well-being as a factor in urban land use planning* (Technical Report #ERC-0174). Atlanta: Environmental Resources Center, Georgia Institute of Technology, 1974.

Kraus, J. Ecology of juvenile delinquency in metropolitan Sydney. *Journal of Community Psychology,* 1975, *4,* 384-395.

Leighton, D., Harding, J., Macklin, D., Macmillan, A., & Leighton, A. *The character of danger (Vol. 3), The Stirling County study of psychiatric disorder and sociocultural environment.* New York: Basic Books, 1963.

Meyer, M., & Gerrard, M. Graduate training in community psychology. *American Journal of Community Psychology,* 1977, *5,* 155-164.

Monahan, J. The prevention of violence. In J. Monahan (Ed.), *Community mental health and the criminal justice system.* New York: Pergamon Press, 1975.