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Community types and mental health: a multilevel study of local environmental stress and coping

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Abstract Research has found that neighborhood structural characteristics can influence residents' mental health. Few studies, however, have explored the proximal reasons behind such influences. This study investigates how different types of communities, in terms of environmental stressors (social and physical disorder and fear of crime) and social resources (informal ties and formal organizational participation), affect well-being, depression, and anxiety in adult residents. Data are from a survey of 412 residents nested in 50 street blocks. Block stressors and resources were cluster analyzed to identify six block types. After controlling for several individual- and block-level characteristics, results from multilevel models suggest that in communities facing relatively few stressors, higher levels of formal participation are associated with better mental health. Because high levels of formal participation were not found in communities with higher levels of stressors, the impact of participation in such contexts could not be examined. However, results suggest that in communities where stressors are more common, isolation from neighbors may have a protective effect on mental health.

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Introduction

Shared structural characteristics of the residential environment, such as aggregated socioeconomic characteristics of residents, have been consistently linked to mental health outcomes (e.g., Leventhal & Brooks-Gunn, 2000; Ross, 2000; Ross, Reynolds, & Geis, 2000; Silver, Mulvey, & Swanson, 2002; Xue, Leventhal, Brooks-Gunn, & Earls, 2005, but see Fauth, Leventhal, & Brooks-Gunn 2004). To better understand the role of context, comprehensive ecological models require specification of the ways through which community context acts to influence mental health. To date, there has been little examination of the specific attributes of area of residence relevant to mental health beyond traditional demographic variables (e.g., Diez-Roux, 2003), but research suggests that the daily experience of living in an area where environmental stressors are concentrated and where collective resources are lacking may explain the negative impact of living in a disadvantaged environment on mental health (e.g., Elliot, 2000; Hill & Angel, 2005; Macintyre, Ellaway, & Cummins, 2002; Ross, 2000; Whitley & Prince, 2005; Xue et al., 2005). However, the impact of stressors and resources may depend on the type of community in which they are found (e.g., Caughy, O'Campo, & Muntaner, 2003). This study explores whether particular structures of stressors and resources have different effects on residents' mental health. A dimensional

approach is used to identify different configurations of community stressors and resources.

Collective stressors and social resources: disorder, fear of crime, informal ties and formal participation

Neighborhood social and physical disorder has been measured in various ways (e.g., perceived or objective loitering youths, graffiti, litter, dilapidation), but is consistently associated with fear of crime (Perkins & Taylor, 1996). It is thus an indicator of environmental stress that may negatively influence mental health at the community level. Environmental stressors found in disadvantaged areas are likely to be chronic and affect all residents of the area (Collins & Schulte, 2003; Wright & Fisher, 2003). Thus, daily encounters with environmental stressors such as disorder may heighten residents' levels of distress, regardless of their own individual-level risk factors (e.g., Diez-Roux, 2001; Ross, 2000). Signs of disorder may also serve as cues indicating an inability or unwillingness of residents and official agents to cope with local problems more generally (Taylor, 1987). Additionally, the deleterious effect of disorder could be more pronounced when coupled with fear of crime (see Wandersman & Nation, 1998). The concentration of social problems in disadvantaged areas is likely to elicit not only fear and distrust, but also low self-esteem and feelings of powerlessness (Geis & Ross, 1998; Macintyre & Ellaway, 2003; Wright & Fisher, 2003).

The residential environment not only carries potential stressors, it also provides resources that may have a positive impact on mental health, like formal and informal social ties. Informal ties with neighbors have been shown to buffer the negative effect of neighborhood disadvantage on mental health (Ross & Jang, 2000; Xue et al., 2005). However, evidence also suggests that the beneficial effect of informal ties may depend on the type of neighborhood in which they are found (i.e., more or less wealthy, predominantly white versus minority neighborhoods) and the extent to which informal networks are coupled with more formal ties to institutions (Caughy et al., 2003; Latkin & Curry, 2003; Warner & Roundtree, 1997; Wen, Cagney, & Christakis, 2005). Thus, formal organizational participation needs to be considered in addition to informal networks. Indeed, voluntary associations may generate specific forms of social capital (Sampson, 2003) and help residents deal with environmental adversity (Wandersman & Florin, 2000). Formal participation may be of critical importance for connecting neighborhoods to external resources, especially in cases where informal ties are nonexistent or, due to segmentation, do not translate into social order.

Capturing complex contextual synergies by studying community types

The environmental stressors and resources thought to impact residents' mental health show complex patterns of interactions and reciprocal influences. A recent literature review on the community context of mental and physical health concluded that processes may play out differently in different contexts (Shinn & Toohey, 2003). For example, evidence shows that informal ties with neighbors are beneficial in advantaged areas but that they can be detrimental in disadvantaged areas (Caughy et al., 2003; Ceballo & McLoyd, 2002; Warner & Roundtree, 1997; Wen et al., 2005). Wilson (1996, p. 63) explains how social integration, although generally positive, may not be beneficial in areas where deviant behaviors are common. In these instances, restriction of social contact to immediate family or familiar positive supports or role models may turn out to be a more adaptive choice. Also, Warner and Rountree (1997) suggest that the inefficacy of informal ties in disadvantaged communities may be due to the fact that they do not as easily transfer into formal ties to external community agencies (see also Altschuler, Somkin, & Adler, 2004). Additional research on the possible "downsides" of social capital is needed (Caughy et al., 2003; Lochner, Kawachi, Brennan, & Buka, 2003).

The complex interplay between stressors and resources at the community level makes dimensional approaches an interesting alternative to traditional linear models (McKenzie, Whitley, & Weich, 2002). Gorman-Smith, Tolan, and Henry (2000) have posited that studying interplays of community characteristics with traditional analyses is difficult because linear models are not designed to understand the impact of configurations of factors precisely because their goal is to eliminate co-varying predictors. They noted that such an approach may underestimate the variations in place characteristics configurations, and their complex relation to individual outcomes.

In contrast, dimensional analyses, such as cluster analysis, allow us to investigate the impact of synergies of environmental factors on mental health (Luke, 2005). Their focus on subsample types based on patterns among combinations of variables rather than on linear relationships among separate variables across a whole sample is seen as a possible response to the limitations of variable-oriented analysis for handling complex interactions (Bergman, 1998). Three and four-way interactions may be incorporated into linear models, but they are difficult to interpret and they do not insure that the combinations of values across multiple variables implied by the interaction term can

actually be found in reality. The characteristics of dimensional analyses are particularly interesting in the context of this study because some social processes may emerge in a limited range of contexts. For example, formal participation is less likely to arise in low-income neighborhoods facing many stressors (Altschuler et al., 2004; Perkins, Brown, & Taylor, 1996). However, despite the fact that some social processes appear to emerge mainly in richer environments (Sampson, Morenoff, & Earls, 1999), substantial and important variation in social processes exists even among the poorest communities (Gorman-Smith et al., 2000). Dimensional analyses may help us understand the link between actual constellations of stressors and resources and residents' mental health.

The street block as a living environment

Most of the research on place effects and health has relied on the use of census data, aggregated at the level of block group (around 1000 residents) or census tract (around 4000 residents) to characterize living environments (Subramanian, Jones, & Duncan, 2003). Census-based geographic units are not necessarily ecologically valid, and the choice of the unit of analysis should take into account the underlying conceptual model (Galea, Ahern, & Karpati, 2005). Theoretical and empirical considerations suggest that the street block—both sides of a street bounded by two cross-streets or dead end—may be relevant for mental health, as well as for the ecological resources and strains hypothesized to influence it. In fact, given the proximity of the block environment and that "residents tend to interact with their neighbors and carry out activities within a physical environment that is close to their homes" (Galea et al., 2005, p. 2420; see also Wen et al., 2005), what happens on the block is likely to affect residents much more than incidents elsewhere in the neighborhood (Perkins, Florin, Rich, Wandersman, & Chavis, 1990). Also, evidence suggests that very small areas, much smaller than census tracts or even block groups, may be relevant for local environmental phenomena linked to residents' mental health (Kuo, Sullivan, Coley, & Brunson, 1998; Tita et al., 2005).

Hypotheses

This article examines whether residential street blocks can be categorized according to aggregate stressors and resources in such a way as to have a differential impact on residents' mental health. Two negative (disorder and fear of crime) and two positive (informal social ties among neighbors and formal organizational participation) dimensions are included in a cluster analysis to define block types. Multilevel modeling is used for estimating the impact of block types on mental health (general well-being, depression, anxiety). It is hypothesized that significant variation will be found at the block-level, and that block types will, at least partly, explain that variation over and above the influence of socioeconomic characteristics and personal stress and support, at both the individual and the aggregated block levels. The socioeconomic predictors tested (income, education, residential stability, marital status, sex, age, race, employment) include those found to be most important when studying place effects (Leventhal & Brooks-Gunn, 2000). Those living on blocks with more disorder and fear of crime, along with few collective social resources they can rely on, should present the poorest mental health outcomes. Residents of blocks with little aggregate disorder and fear and more informal ties and formal civic participation should experience relatively better outcomes. Finally, the impact of informal ties in poorer communities may change whether they are coupled with formal citizen participation or not.

Method

Site Selection

The data were collected in the late winter of 1987 in 50 neighborhoods spread throughout a large city in the Mid-Atlantic region of the United States. A multistage, clustered probability sampling frame was constructed. Fifty empirically delineated neighborhoods (i.e., based on resident definitions and associations rather than Census Tracts) out of 249 in the city (excluding public housing projects and the downtown business district) were selected. Neighborhoods were selected with probability proportionate to total population using a geographic ordering and a systematic sampling interval to ensure a distribution of neighborhoods throughout the entire city. One street-block in each of the 50 neighborhoods was selected with probability proportionate to the number of residential households listed for the block in a reverse telephone directory.

Occupied households on each selected block were enumerated in the field, and 12 households on each block were selected to the sampling frame (with a goal of completing at least eight interviews per block) using a systematic sampling procedure in which a random starting address was identified and a sampling interval was calculated based on the size of the block (e.g., every fifth address) to ensure geographic distribution

throughout the block. The mean number of households on the 50 study blocks was 42.5 (ranging from seven to 98; SD = 29.8).

Interview procedures and respondents

Interviews took approximately 35 min to complete. Of the 412 interviews completed, about half were by telephone and half were in-person. Out of an initial sample frame of 601 potential respondents, 13 households were not needed as block quotas were reached prior to contacting them and 13 others were verified in-person as vacant, thus leaving and *n* of 575 households where contacts were attempted. Using this as the denominator, our response rate was 72%. If one looks only at those households in which someone was actually reached ($n = 492$), however, the per-household-contacted response rate becomes 84% (*n* of refusal, break-offs, and language problems = 80).

Sample

Eligible respondents were heads of households or spouses of heads. Where more than one (head or spouse) was available, a designated respondent was randomly selected. Replacement households were allowed only after several unsuccessful attempts at obtaining an interview. In order to minimize potential bias, within household replacements were not allowed.

Aside from 65.5% being female, the selected sample represented the overall city population: 52.4% of the total sample were black; 46.3% were white. The mean age was 49.7 years and the mean residential stability was 13.9 years at current address and 14.6 years in the current neighborhood. Homeowners made up to 58.5% of the sample. The mean household size was 2.9. Roughly half the sample had a household income of $20,000 or more in 1986 and about half were high school educated.

Respondent and non-respondent households were compared on the environmental features assessed. Out of 17 comparisons, only one was significant at $P = .05$—about what would be expected by chance, suggesting that there was no important self-selection bias in respondents' home environments and that they were reasonably representative of their block as a whole.

Measures

Table 1 gives the descriptive statistics at the individual and block levels for all variables. Individual-level variables were aggregated to create block-level variables. Alphas and eta-squared statistics (giving the proportion of variance lying between blocks) are also listed.

Mental health outcomes

Depression ($\alpha = .83$) was assessed with the 6-item depression factor of the Center for Epidemiologic studies—Depression scale (CES-D; Radloff, 1977). The participants were asked to what extent the items described how they felt (e.g., felt depressed, felt sad) in the past week. Answers were given on a 3-point scale (0 = rarely; 1 = sometimes; 2 = often). *Anxiety* was measured using the 20-item State-Trait Anxiety Inventory (Spielberger, 1973) adapted to measure anxiety experienced over the past week ($\alpha = .92$). The participants were asked to indicate if the items (e.g., felt tense, felt nervous) applied to how they felt in the past week. Answers were given on the same 3-point scale. *Well-being* ($\alpha = .70$) was evaluated using a 3-item scale representative of the General Well-being Schedule created for the National Center for Health Statistics (Dupuy, 2001). Answers to questions about general health, energy and spirits were given on a 4-point scale ranging from 0 = poor to 3 = excellent.

Covariates

Demographic variables included sex (0 = male; 1 = female), age (in years), race (0 = non-white; 1 = white), household income (in thousands), education (in years), unemployment, single parenthood and residential stability (in years). As over 98% of the sample self-identified as either black-non-Hispanic or white-non-Hispanic, racial composition was computed as the proportion of white respondents. Household combined gross income was estimated based on nine categories ranging from ''less than 5000'' (estimate = $2,500) to ''more than 40,000'' (estimate = $50,000) in 1986 U.S. dollars.

Personal stress was measured by combining 20 items measuring different aspects of stress: negative life events, daily hassles, and negative interpersonal experiences ($\alpha = .84$). Life events included seven standard serious negative life experiences occurring in the past 12 months (e.g., serious illness, divorce). Answers were coded on a dichotomous scale. Daily Hassles were based on five domain-representative items from a longer inventory (DeLongis, Coyne, Dakof, Folkman, & Lazarus, 1982). Respondents were asked whether any of the listed difficulties had happened in the past 4 weeks (e.g., household problems, economic stress). Answers were coded on a 3-point scale (0 = none to

Table 1 Descriptive statistics at the individual and block levels

	n	*N* items	%	Range	*M*	*SD*	α	η^2
Individual-level								
Outcomes								
Well-being	400	3		0–9	5.7	2.0	.70	.22***
Depression	405	6		0–12	2.0	2.6	.83	.13
Anxiety	405	20		0–37	9.1	7.9	.92	.17*
Covariates								
Sex (female)	412		65.5					.14*
Age	303			20–88	49.7	15.5		.31***
Race (white)	410		46.3					.75***
Income (×$1000)	370			2.5–50	22.2	15.3		.40***
Education (years)	410			12–20	12.1	3.2		.37***
Unemployed	411		4.6					.22***
Single parent	325		8.3					.23***
Stress	406	20		0.0–16.5	5.3	3.7	.84	.16*
Support	407	8		1–16	13.6	3.3	.87	.18**
Residential stability (years)	297			0.6–60.0	13.9	11.9		.26***
Local environment physical and social characteristics								
Disorder	398	12		0–12	2.4	2.5	.88	.41***
Fear of crime	401	12		0–12	4.0	2.9	.90	.25***
Participation	399	21		0–18	1.9	2.5	.78	.25***
Informal ties	411	11		0–11	5.9	3.1	.83	.26***
Block-level								
Covariates								
Prop. Women	50			0.25–1.00	0.65	0.20		
Avg. age	50			28.8–72.0	49.0	9.15		
Prop. Whites	50			0–1	0.47	0.44		
Avg. income	50			4.6–45.4	22.2	9.94		
Avg. education	50			8.0–17.4	12.1	1.97		
Prop. unemployment	50			0–0.5	0.05	0.10		
Prop. Single parent	50			0–0.6	0.1	0.14		
Avg. Stress	50			1.8–8.4	5.29	1.50		
Avg. support	50			10.3–15.9	13.56	1.41		
Avg. resid. Stability	50			2.0–28.0	13.51	6.41		
Local environment physical and social characteristics								
Avg. disorder	50			0.06–7.50	2.39	1.64		
Avg. fear of crime	50			0.92–7.13	4.04	1.46		
Avg. Participation	50			0.00–6.25	1.84	1.26		
Avg. informal ties	50			2.00–9.13	5.90	1.59		

*$P < .05$. ** $P < .01$. *** $P < .01$

Note: η^2 = Eta squared. Avg. = Average. Prop = Proportion

1 = many). Eight *Negative Interpersonal Experiences* items (e.g., too many demands made by others, others adding to own problems) were taken from the Interpersonal Experiences Questionnaire (Shinn, Lehmann, & Wong, 1984). The time frame was the past 4 weeks, and answers were given on 3-point scale (0 = little or none, 0.5 = some, 1 = most or all of the time).

Social support. Perceived social support was measured using eight selected items (α = .87) from a 20-item survey developed by the Rand Corporation (Sherbourne & Stewart, 1991). Respondents' signified perceived availability of social support by indicating whether the listed sources of support (e.g., someone to help, to show love and affection, to loan a significant amount of money) would have been available if needed in the past 4 weeks most or all (= 2), some (= 1), or little or none of the time (=0).

Block stressors and resources

Scales measuring block stressors and resources were first computed at the individual level and then aggregated at the block-level. At the block level, disorder, fear of crime, participation and informal ties represent the four variables eventually used in the cluster analysis to characterize the physical and social characteristics of the local environment. In addition, all individual-level covariates introduced in the previous section were aggregated in order to be included as block-level control variables in the final multilevel analyses.

Disorder. The disorder scale included six items about perceived physical disorder (e.g., vandalism, vacant housing, trash in the streets) and six items about perceived social disorder (e.g., groups of teenagers

hanging out, people fighting/arguing in the street). Respondents had to judge whether these items represented big problems (= 1), somewhat of a problem (= 0.5) or not a problem at all (= 0) on their block (α = .88).

Fear of crime. Fear of crime was measured with 12 items adapted from earlier studies (e.g., Taylor, Gottfredson, & Brower, 1984). Items measuring three dimensions of fear were included. First, an emotional dimension, capturing the standard National Crime Survey fear of crime index, was measured with four items (i.e., how safe would you feel being out alone on your block/neighborhood during the day/night). Answers were given on a 4-point scale (0 = very safe to 1 = very unsafe). Second, five items were used to assess how ''worried'' one is (0 = not at all worried; 1 = very worried) about negative events that could happen to them on the block (e.g., being assaulted, threatened). Finally, a behavioral dimension referring to the tendency to avoid places in the surrounding area, on the basis that they may be dangerous, were measured with three dichotomous yes/no items (e.g., staying in to avoid crime). The reliability of the overall scale is high (α = .90).

Informal ties with neighbors. Informal social ties in the last 12 months were measured with 11 dichotomous yes/no items. Eight items measured instrumental support given to neighbors and received from them (e.g., keeping watch on a house/apartment; lending tools). Three items measured informal socialization with neighbors (spoken to a neighbor; visited inside a neighbor's house). The reliability of the overall scale is good (α = .83).

Formal participation. Participation in community organizations was measured by asking respondents if (1) they were a member of a local organization, (2) they did work for that organization, and (3) anyone else in the household was a member. The types of organizations included church or synagogue groups, community centers or youth organizations, local political or issue-oriented groups or neighborhood improvement associations. The reliability of the 21-item scale is good (α = .78).

Results

Cluster analysis: block patterns

A cluster analysis was performed to identify groups of street-blocks sharing similar profiles in terms of community stressors and resources. Four aggregated scales were used in this analysis: two stressors (disorder and fear of crime) and two resources (participation and informal ties with neighbors). Correlations at the block-level (N = 50) between the scales showed significant, moderate-sized associations with absolute values ranging from r = .30 to .50, $P < .05$, except between disorder and fear of crime (r = .69, $P < .001$). As expected, stressors and resources were negatively correlated, whereas correlations between stressors and between resources were positive. These results suggest that the scales were tapping related but distinct block-level characteristics.

A *k*-means cluster algorithm was used for clustering. The a priori specification of the number of clusters was guided by the results of previous studies (Aneshensel & Sucoff, 1996; Gorman-Smith et al., 2000) and by the visual examination of a dendrogram obtained with preliminary hierarchical cluster analysis using Ward's method (Aldenderfer & Blashfield, 1984). Based on these considerations, a 6-cluster solution was chosen.[1]

The best way to validate a cluster solution is to show the distinctiveness of the clusters on external variables not used to generate them (Aldenderfer & Blashfield, 1984). Significant differences found between clusters in demographics and mental health outcomes, as described in the following sections, provided such external validation. The internal consistency of the solution was also tested by randomly splitting the sample in 2 halves of 25 blocks each. Similar block types were found in both halves (results not shown). Also, when comparing the results of the *k*-means solution to the preliminary clusters found with Ward's hierarchical method, a correspondence rate of 86% was found.

[1] Two studies using cluster analysis helped to determine the number of clusters. Both were conducted within the boundaries of a single city, like the present study. The first one sampled only poor, urban neighborhoods and used six variables to perform a cluster analysis, including safety concerns and neighborliness, along with four other structural characteristics (Gorman-Smith et al., 2000). The authors found three neighborhood types that significantly affected adolescent outcomes. The second study included a more complete neighborhood range, and cluster analysis was performed with two sets of variables representing SES and race/ethnic composition (Aneshensel & Sucoff, 1996). The authors found eight different neighborhood clusters that significantly influenced adolescent mental health. Given that in the present study, the sampling is not limited to poor, urban neighborhoods but rather is spread throughout the whole city, a number of groups above three and around eight are expected to be found. Looking at the dendrograms issued from Ward's method of hierarchical cluster analysis performed on the total sample and in the two random split-halves, it was found that within the range of possibilities defined above, a six-cluster solution was our best option (this solution was suggested in dendrograms issued from the total sample as well as from both random split-halves).

Comparing block types

Each block type is summarized in Tables 2 and 3 in terms of collective stressors and resources (Table 2) and socioeconomic characteristics, personal stressors and support and mental-health outcomes (Table 3). For both tables, post hoc comparisons were conducted using Tukey's Honestly Significant Difference test. This test is appropriate when all possible comparisons between groups are evaluated. Results of these comparisons are presented through subscripts. Depending on the number of significant contrasts, shared subscripts in each column indicate non-significant comparisons (Table 2) or significant ones (Table 3).

Table 2 presents the six block types issued from the *k*-means cluster analysis, with their centered mean scores on the four variables used for clustering (disorder, fear of crime, participation, and informal ties). On average, block types in the top-half of the table were experiencing lower levels of disorder, and block types in the bottom-half of the table were experiencing higher levels of disorder. As expected, an Analysis of Variance (ANOVA) comparing the block types revealed that they significantly differed on all four variables included in the cluster analysis ($P < .001$).

Table 3 compares the block types in terms of aggregated socioeconomic characteristics, personal stress and support, and mental health outcomes. ANOVAs showed significant differences across block types in racial composition, income, unemployment, single parenthood, residential stability, aggregated levels of personal stress and support and mental-health outcomes. Non-significant results were found for education, age and proportion of women. Results presented in Tables 2 and 3 show a clear pattern in which block types experiencing less disorder were also advantaged in terms of their socioeconomic characteristics, and vice-versa.

''Generally Advantaged'' blocks (cluster 1). The ''Generally Advantaged'' block type is highly advantaged in many respects as compared to all other types. In terms of their social stressors and resources, blocks

Table 2 Mean Scores, standard deviations, and ANOVAs results for variables defining block types

Block type	*N*	Disorder		Fear of crime		Participation		Informal ties	
		M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
1 Generally Advantaged	12	-1.57^{a}	0.66	–1.86	0.79	0.53^{a}	0.75	1.71^{a}	0.91
2 Organized	3	$-0.69^{a,b,c}$	0.25	$0.54^{a,b}$	0.40	3.16	1.19	$1.07^{a,b}$	0.18
3 Middletown	13	-0.73^{b}	0.61	-0.03^{a}	0.69	$0.13^{a,b}$	0.87	$-0.02^{b,c}$	0.87
4 Anonymous	8	$0.40^{c,d}$	0.90	0.35^{a}	1.20	-1.12^{c}	0.69	-2.34^{d}	0.89
5 Moderately Disadvantaged	11	1.33^{d}	0.59	$1.03^{a,c}$	1.02	$-0.58^{b,c}$	0.73	$-0.06^{b,e}$	1.07
6 Very disadvantaged	3	4.15	1.04	$2.31^{b,c}$	0.49	$-0.72^{a,b,c}$	0.94	$-1.36^{c,d,e}$	0.59
Total	50	0.00	1.64	0.00	1.46	0.00	1.26	0.00	1.59

Notes. Means in a column sharing subscripts are *not* significantly different ($P < .05$)

Table 3 Mean scores and ANOVAs results for main demographic control and outcome variables as a function of block types

Block type	Race (% white)	Income (thousands)	Unemployment	Single parent	Res. Stability (years)	Avg. Stress	Avg. Supp.	Well-being	Depression	Anxiety
1 Generally advantaged	$0.88^{a,b,c,d}$	$32.00^{a,b,c,d}$	0.00^{a}	$0.01^{a,b}$	15.90	4.90	$14.69^{a,b}$	6.17^{a}	1.61^{a}	8.06^{a}
2 Organized	0.54	28.29^{e}	0.00^{b}	0.05^{c}	16.38	5.21	13.87	5.92	1.42	7.63
3 Middletown	0.37^{a}	21.74^{a}	0.00^{c}	0.08^{d}	16.71	5.13	13.67^{c}	5.62	1.84	8.84
4 Anonymous	0.29^{b}	15.28^{b}	0.09	0.02^{e}	10.43	4.38	12.38^{a}	6.29^{b}	1.90	8.29
5 Moderately disadvantaged	0.37^{c}	19.30^{c}	0.03^{d}	0.16^{a}	9.59	6.08	13.59	$5.11^{a,b}$	2.28	10.39
6 Very disadvantaged	0.00^{d}	$8.11^{d,e}$	$0.25^{a,b,c,d}$	$0.36^{b,c,d,e}$	9.82	7.13	$11.29^{b,c}$	4.79	3.42^{a}	14.25^{a}
Total	0.47	22.21	0.05	0.09	13.51	5.29	13.56	5.72	1.96	9.16
ANOVA *F*(5. 44)	4.52**	8.22***	4.87**	5.89***	3.00*	2.72*	6.69***	3.45*	2.52*	2.68*

*$P < .05$; **$P < .01$; ***$P < .001$

Note. Means in a column sharing subscripts are significantly different ($P < .05$)

ANOVAs for education, age and proportion of women were *ns*

in that cluster showed the lowest levels of disorder and fear of crime along with the highest level of informal ties and second highest level of participation. Not surprisingly, this block type is not only advantaged in terms of environmental configuration of stressors and social resources, but also in terms of its socioeconomic characteristics. Indeed, this block is characterized by the highest income level. Also, residents living in this block type were predominantly white (88%), and they reported low levels of personal stressors as well as many available sources of personal support. Accordingly, residents living on this block type reported, on average, better mental health outcomes than residents living on disadvantaged block types.

''Organized'' and ''Middletown'' blocks (clusters 2 and 3). The next two block types are similar to each other in many respects. They were both found to be moderately advantaged in terms of environmental stressors and resources, showing similar, moderately low levels of disorder and fear of crime. They also shared similar socioeconomic and personal stress and support characteristics, all situated in the same average range. They were also characterized by better than average mental health outcomes. However, these two block types were differentiated by their level of formal participation. The ''Organized'' block type (cluster 2) was characterized by having by far the highest level of formal organizational participation of any type, whereas the ''Middletown'' block type (cluster 3) was characterized by average levels in all four clustering criteria, including participation.

''Anonymous'' and ''Moderately Disadvantaged'' blocks (clusters 4 and 5). These two block types could both be seen as falling into a moderately disadvantaged category in terms of their level of stressors and of socioeconomic characteristics. They were both characterized by similar, above average levels of disorder and fear of crime. In terms of socioeconomic characteristics, they tended to show similar, moderately below-average scores. What differentiated them was their level of informal ties. The ''Anonymous'' block type showed the lowest levels of informal ties and participation of all types whereas the level of informal ties in the ''Moderately Disadvantaged'' block type was average. In terms of mental health outcomes, both block types were not significantly different in depression or anxiety, but the ''Anonymous'' blocks were characterized by significantly higher levels of well-being.

''Very disadvantaged'' blocks (cluster 6). Compared to all the preceding block types, the last one is highly disadvantaged in many respects. First, its levels of disorder and fear of crime were the highest of all types, with scores over 2.5 *SD* and 1.5 *SD* above the general mean, respectively. This block type was entirely African-American. The average income was almost one *SD* below the general mean, and the proportion of unemployment and single parenthood were much higher than in any other type. Also, this block type had few collective social resources: it was among the lowest clusters in organized participation and informal ties. Residents from this type also reported the highest level of stress and lowest level of support. Not surprisingly, residents from that block type also reported the worst mental health outcomes.

Interestingly, we did not find in this sample any block type having both high levels of environmental stressors *and* of social resources. This finding is in accordance with previous research suggesting that protective social processes are less likely to arise in neighborhoods that could benefit from it most, that is those situated in low-income areas facing many stressors (Altschuler et al., 2004; Perkins et al., 1996).

Multilevel models

Multilevel models are appropriate for nested data such as ours, where residents are nested within blocks (Subramanian, 2004). Multilevel models allow us to partition total outcome variance into its individual (within) and block (between) components, and to insert covariates at both levels.

Unconditional models. Consistent with eta-squared statistics reported in Table 1, results from unconditional multilevel models showed significant variation at the block-level for both well-being and anxiety, but not for depression (although block types did range in mean depression scores from 1.42 to 3.42). Block-level variance represented 10.8% ($P < .001$) of the total variance for well-being. For anxiety, the percentage was of 5.1% ($P < .05$). These percentages are consistent with those found in previous neighborhood effects studies, where the neighborhood-level variance accounts for about 5–10% of the total variance in psychological outcomes (Leventhal & Brooks-Gunn, 2000). The relatively high percentage found for well-being could be related to the use of a smaller geographic level of aggregation used in this study.

Conditional models. For well-being and anxiety, three conditional models including individual- and block-level covariates were performed (Table 4). The three models include the same individual-level covariates, but differ in their block-level covariates. Model A includes all blocks socioeconomic characteristics that were individually shown to affect either well-being

Table 4 Random intercept multilevel models for well-being and anxiety: fixed effects parameter estimates

	Well-being			Anxiety		
	Model A	Model B	Model C	Model A	Model B	Model C
Intercept	5.83***	5.83***	5.83***	8.83**	8.85**	8.86***
Individual-level[a]						
Sex (female)	–0.03	–0.03	–0.03	1.13	1.13	1.13
Age	–0.02~	–0.02~	–0.02~	–0.01	–0.01	–0.01
Race (white)	–0.65	–0.65	–0.65	2.87~	2.87~	2.87~
Income (thous.)	0.02*	0.02*	0.02*	–0.05	–0.05	–0.05
Education (years)	0.00	0.00	0.00	–0.11	–0.11	–0.11
Unemployed	0.52	0.52	0.52	–1.17	–1.17	–1.17
Single parent	–0.05	–0.05	–0.05	2.80	2.80	2.80
Stress	–0.09*	–0.09*	–0.09*	1.08***	1.08***	1.08***
Support	0.14***	0.14***	0.14***	–0.69**	–0.69**	–0.69**
Block-level[b]						
Block socioeconomic characteristics						
Avg. income	0.00		0.02	0.00		–0.05
Avg. education	0.32***		0.31***	–0.72~		–0.66~
Prop. single parent	–0.76		0.86	0.19		–5.63
Avg. resid. stability	0.02		0.03	–0.32***		–0.36***
Block type[c]						
1 Generally advantaged		0.69	0.26		–1.41	–0.86
2 Organized		0.82*	0.60~		–2.75~	–2.48~
4 Anonymous		0.75	1.30*		–0.81	–4.16 *
5 Moderately disadvantaged		–0.42	–0.16		1.87	–0.48
6 Very disadvantaged		–0.57	0.23		4.43*	1.49

~ $P < .10$. * $P < .05$. ** $P < .01$. *** $P < .001$

Note. [a] Individual-level and block-level predictors are grand-centered

[b] Block-level predictors are grand-centered

[c] coded as dummy variables with cluster 3 (''Middletown'' block type) as the reference category

or anxiety in preliminary multilevel analyses.[2] Model B includes block types, coded as dummy variables, with the ''Middletown'' block type as the reference category. Model C integrates both block socioeconomic characteristics and block types in the same model.

For well-being, Model A shows that the block level of education significantly affects residents' well-being after controlling for individual-level covariates. Higher levels of education among residents are associated with higher levels of well-being. Model B shows that living in an ''Organized'' block is associated with higher levels of well-being, again after controlling for individual-level covariates. Because the ''Organized'' cluster distinguished itself from the ''Middletown'' blocks by its very high level of formal citizen participation, this result suggests that living in a participative block may have a positive impact on well-being, over and above individual socioeconomic characteristics and individual perceived stress and support. However, because participation was concentrated in relatively advantaged blocks, it is impossible to tell if formal participation would have had the same effect in low-income blocks facing high levels of environmental stressors. Finally, Model C confirms that the effect remains marginally significant ($P = 0.050$) after controlling not only for individual confounding variables, but also for block socioeconomic characteristics. Thus, the positive effect of living in an ''Organized'' block on well-being cannot be solely attributable to the relatively advantaged socioeconomic characteristics of that type.

A new result emerged in Model C, showing that after controlling for block socioeconomic characteristics, living in an ''Anonymous'' block type, where formal participation and informal ties are at the lowest, is associated to higher levels of well-being. To put it another way, well-being in ''Anonymous'' blocks is higher than what was expected based on residents' individual and aggregated characteristics. This suggests

[2] Proportions of whites and of unemployment are not included because they were not found to be significantly related to well-being or anxiety in preliminary multilevel analyses. It is relevant to note, however, that we checked that the results did not change in substance when adding those two variables in the models. Also, because results in Table 1 suggested that blocks explained part of the variance found in individual stress and support, we also checked the impact of adding those two covariates at the block level. Again, the conclusions were not substantially affected.

that in blocks with moderate levels of stressors, low social integration on the block may enhance residents' well-being. To further support this interpretation, Model C was performed a second time, using the ''Moderately Disadvantaged'' type as the reference category (results not shown). Recall that the only significant difference between the ''Moderately Disadvantaged'' type and the ''Anonymous'' type was their level of informal ties with neighbors (see Table 2). Results when using this new reference category showed a significant difference in well-being between those two types ($P = .004$), supporting the conclusion that in blocks facing relatively high (but not extreme) levels of environmental stressors, social isolation from neighbors is associated with higher well-being.

After controlling for important individual-level characteristics, the levels of well-being found in ''Generally Advantaged'', ''Moderately Disadvantaged'' or ''Very Disadvantaged'' blocks were not significantly different from those of the ''Middletown'' blocks. Thus, individual-level variables were sufficient to explain the gap in well-being between residents living on these types of blocks (see Table 3).

The results for anxiety are very similar to those found for well-being. Indeed, the results show (1) that living in an ''Organized'' or ''Anonymous'' block is associated with lower anxiety over and above individual and block confounding characteristics and (2) that the higher levels of anxiety found in ''Moderately Disadvantaged'' or ''Very Disadvantaged'' blocks are explained by these blocks' socioeconomic characteristics.

First, Model A shows that after controlling for individual-level covariates, higher levels of education on the block are associated with better mental health outcomes, that is lower anxiety. A new result also emerges in Model A, showing that block-level residential stability is associated with lower levels of anxiety among block residents.

Consistent with previous findings, model B shows that, as compared to the ''Middletown'' block type, residents of ''Organized'' blocks report better mental health. Also, Model B shows that residents of ''Very Disadvantaged'' blocks have significantly higher levels of anxiety. This result was not echoed in the well-being models, where there was no more than a non-significant tendency toward poorer mental health in ''Disadvantaged'' and ''Very Disadvantaged'' blocks. If the results seem different in Model B, the general conclusions regarding the impact of living in the most disadvantaged blocks remain unchanged. Indeed, Model C shows that when block socio-economic composition is taken into account, the association found between living in a ''Very Disadvantaged'' block and anxiety does not hold. That is, structural characteristics of the block are sufficient to explain why residents of ''Very Disadvantaged'' blocks report higher levels of anxiety.

Model C reveals a familiar pattern, where ''Organized'' and ''Anonymous'' block types are associated with better mental health outcomes. That is, results suggest that higher levels of formal participation in blocks facing average levels of stressors are associated with better mental health outcomes, whereas in blocks where the level of stressors is higher, lower informal ties are related to better mental health. Again, to corroborate this interpretation, Model C was performed with the ''Moderately Disadvantaged'' type as the reference category (results not shown). Results when using this new reference category showed a marginally significant difference in well-being between those two types ($P = .064$), again supporting the conclusion that in blocks facing relatively high (but not extreme) levels of environmental stressors, social isolation from neighbors is associated with better mental health outcomes.

Discussion

The results of the cluster analysis demonstrate that disorder, fear of crime, participation, and informal social ties can be used to identify distinct block types. ANOVAs showed that block types vary significantly not only in the four characteristics used to generate them, but also in racial composition, mean income, unemployment, single parenthood, residential stability, levels of personal stress and support and mental health.

Unconditional multilevel models showed significant variation at the block-level for well-being and anxiety, but not for depression. Conditional multilevel models controlling for a host of individual- and block-level variables showed that the mental health of residents living in a ''Generally Advantaged'', a ''Moderately Disadvantaged'' or a ''Very Disadvantaged'' block type was not significantly different from that of residents living in average, ''Middletown'' blocks. Thus, for the block types at the extremes of the continuum, that is, blocks facing very low or very high degrees of environmental stressors, the particular combinations of stressors and resources on the block had no impact on mental health over and above individual and block socioeconomic characteristics. However, all possible combinations of stressors and resources were not observed, so the results do not necessarily extend to other non-observed situations. For example, because

average formal participation was low in those block types facing higher levels of stressors, it was impossible to determine if high levels of participation in those blocks would also have a positive effect on mental health. In this case, the dimensional approach we used proved helpful to locate and delimit the range in which the participation effect operates.

Most interestingly, when block demographics were taken into account, comparatively better mental health outcomes were apparent for ''Organized'' and ''Anonymous'' block types. The same pattern of results was found for both well-being and anxiety. The results thus suggest that in environments facing average levels of environmental stressors, higher levels of formal citizen participation are associated with better mental health outcomes, whereas in environments facing relatively high levels of stressors, low informal ties with neighbors are associated with better mental health outcomes.

These results are in line with those of other studies showing that the influence of social ties is not necessarily identical across different community settings. For example, in contrast to evidence for supportive minority kinship networks (Stack, 1974), the positive impact of informal social ties found in advantaged, predominantly white communities is not necessarily found in minority communities and the protective effect of informal ties may even be reversed in those communities (Caughy et al., 2003; Ceballo & McLoyd, 2002; Warner & Roundtree, 1997; Wen et al., 2005). Qualitative data also reveal that single, African-American mothers residing in poor neighborhoods often cite relations with friends and extended family as a sources of stress (Brodsky, 1999). Finally, the results are consistent with Wilson's (1996) point that informal social integration may not be beneficial in communities characterized by high levels of non-normative behaviors, captured in this study in terms of physical and social disorder and fear of crime.

This study has many methodological strengths, such as its careful sampling design, based on ecologically defined block and neighborhood units representing the full range of residential communities throughout a large city (Duncan & Raudenbush, 2001), its use of standard (with minor adaptations) stress, support, and mental health scales, its inclusion of other survey measures (including disorder, fear, participation, and neighboring) that are theoretically important but relatively uncommon in mental health research, the use of cluster analysis to empirically derive community types and finally, the use of multilevel modeling for estimating the impact of different community constellations on mental health.

One limitation of the present study is that the data were collected in the late 1980s and may not reflect the currently relevant clustering structure and dynamics in the city studied. For example, the scarcity of Hispanics and Asians in the sample would now represent a substantial underestimate of those groups in this same city and be even less representative of cities with larger immigrant populations. However, a study conducted in the same city a decade later found comparable results, suggesting a relative stability of the phenomenon observed (Caughy et al., 2003). Also, the present data does not necessarily reflect block typologies that might be found in other regions and countries. Other limitations include our inability to capture causal relationships or change over time using these cross-sectional data. Direction of causality is also uncertain because, like all other non-experimental neighborhood studies, the findings may potentially be affected by selection bias (Duncan & Raudenbush, 2001). Also, results are prone to the shared-method variance bias, given that the mental health outcomes, the individual and block characteristics were all derived from the same informant. Finally, the conclusions are limited by small sample sizes in certain block types and by the fact that all combinations of community characteristics (and indeed some of the ones that were expected) were not found. Importantly, it was not possible to identify a community type that was disadvantaged but had high formal social cohesion. Thus, the impact of such cohesion in disadvantaged communities could not be assessed.

Future research should test the typological differences suggested in the present results in other samples and ideally with longitudinal data. Also, many of the patterns found deserve deeper, qualitative investigation. For example, a case study comparison of one or more anonymous blocks with one or more disadvantaged blocks may reveal critical explanations for their different stressor conditions and commensurately different well-being and anxiety outcomes despite their similar structural disadvantages. Future studies should also explore the effect of other variables used as clustering dimensions.

In conclusion, the capacity to evaluate the impact of living in different communities as described holistically is the greatest contribution of this paper. As with ethnographic case studies, they force us to look beyond linear relationships among statistically isolated variables to consider different types of real communities in all their complexity. Unlike most ethnographies, however, the present study includes a moderately large and representative sample of individuals and communities that allows us to relate important outcomes, such as

well-being and anxiety, to living on different kinds of blocks with different social profiles and levels of collective stressors. Compared to individual case studies, it also permits greater confidence in generalizing those relationships to similar types of blocks and neighborhoods elsewhere.

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