PEOPLE AND PLACES: CONTRASTING PERSPECTIVES ON THE ASSOCIATION BETWEEN SOCIAL CLASS AND HEALTH

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While a substantial body of evidence demonstrates a strong association between socioeconomic variables and health outcomes, most analyses conceptualize socioeconomic status as an individual characteristic. This article argues for an expanded view that focuses on the relationship between social class and characteristics of the neighborhood and communities in which people live, and illustrates how these characteristics can provide some new directions for research relating class and health. Using the Alameda County Study, the author presents three analyses that support this view. They indicate that socioenvironmental characteristics of areas are importantly related to the mortality experience of individuals, independent of characteristics of the individuals, and that personal and socioenvironmental risk factors cluster together in areas of low income and high mortality. Studying the balance of demands and resources in areas may help to unravel some of the pathways that link social class and health.

A substantial body of evidence demonstrates strong inverse associations between social class[1] and health outcomes, with higher class being associated with lower risk (1). This pattern has been generally found, regardless of what measure of social class is used, what outcomes are studied, and when and where the analyses are done. Even for outcomes that do not follow this pattern, such as

[1]I use the term social class loosely to refer to a broad range of concepts, including socioeconomic status, social class, socioeconomic position, occupational grade, income, education, etc. There are substantial differences between these concepts and their theoretical derivations, and this blurring of distinctions will in the long run impede our progress. However, such blurring does not affect the major points made in this article.

Preparation of this article was supported by grant AG-11375 from the National Institute on Aging.

International Journal of Health Services, Volume 26, Number 3, Pages 507–519, 1996

breast or prostate cancer, survival is worse among those who are poorer (2, 3). Despite this enormous body of evidence, attempts to explain this pattern have been relatively unsuccessful.

In part, this reflects two different approaches to explanation. For some, explanation means uncovering the biologic and physiologic pathways that allow social class to "get under the skin." This leads to studies that examine the role of behavioral factors such as smoking or physiologic pathways such as fibrinogen in accounting for the inverse relationship between social class and health outcomes. However, even if we were able to catalog the full range of behavioral and biologic pathways that allow social class to be associated with increased risk of disease, there would still be major explanatory lacunae. Such explanations do not get at why lower social class groups smoke more or differ on some physiologic indicator. Thus, a complete explanation of the inverse social class–disease association will require an understanding of forces that operate more "upstream" than the usual candidates.

Most analyses of the social class–disease association see the measurement of social class as the measurement of an individual attribute, despite its roots as a group concept. After all, individuals have incomes, particular levels of education or types of occupations, and own things. This approach to the conceptualization and measurement of social class focuses our attention on individual characteristics and ignores the patterned sets of exposures, opportunities, and resources that differ by social class level. It is the relative heterogeneity of these factors between social class groups and the relative homogeneity within social class groups that forces us to look beyond the individual.

It is clear that there are characteristics of groups that are related to social class and that can only be measured at the group level. Wilkinson's (4) report of an association between the equity of income distribution and life expectancy provides one such example; equity of income distribution is by definition a group characteristic. Turning the focus away from social class measures at the individual level also leads to a consideration of the environments in which people live, and how these environments vary by social class. Consideration of the physical environment is at the roots of public health, and is still the focus of much of environmental epidemiology and other areas of public health. But, as Macintyre and colleagues (5) point out, analyses of socioeconomic aspects of environments and their relationship to health outcomes have often proceeded as if the area measures were simply being used as proxies for individual measures. There is, however, a growing literature that suggests that socioenvironmental properties of the environments in which people live may, in themselves, exert an important influence on disease risks. In what follows, I report the results of three of these studies completed with my colleagues at the Human Population Laboratory.

POVERTY AREA AND MORTALITY

Haan, Kaplan, and Camacho (6) studied the impact of residence in a federally designated poverty area on risk of death, using participants in the Alameda County Study. The Alameda County Study is a population-based, prospective study of a stratified random sample of almost 7,000 Alameda County, California, residents. This study, which was begun in 1965, has continued to reinterview study participants, with the latest data collection in 1995. These analyses were restricted to the first nine years of mortality follow-up, 1965–1974, and the 1,811 participants, 35 years of age or older, who lived in Oakland, the largest city in the County. Although the poverty area included only 41 percent of Oakland's residents, it bore a disproportionate share of health problems, social disadvantage, fire, and crime (Table 1).

The analytic strategy was unusual at that time in that it added an ecologic variable, residence in a poverty area, to the standard analysis of the mortality risk of a defined cohort. Thus, regression models included both measures of individual characteristics as well as an indicator variable for residence versus nonresidence in the poverty area. The 35 percent of the cohort who resided in the poverty area had a 45 percent (95 percent confidence interval, 10–92 percent) age- and sex-adjusted elevated risk of death over the nine-year follow-up period (Table 2). Table 2 also indicates the association between residence in the poverty area and mortality risk, with adjustment for a wide range of demographic, behavioral,

Table 1

Characteristics of poverty area, Oakland, Alameda County, California

Area characteristic	Percent
Population	41%
Unemployed males ≥14 yrs	66
Unemployed females ≥14 yrs	61
Aid to Families with Dependent Children	85
Aid to the disabled	73
Aid to the blind	63
Police workload	65
Active tuberculosis cases	68
Dilapidated housing units	69
Renter-occupied units	75
Units with shared or no bathroom	89

[a]Source: reference 6.

Table 2

Estimated relative risk and 95 percent confidence intervals (C.I.) for associations between poverty area residence and nine-year mortality from all causes[a]

Adjustment variable	Approximate relative risk[b]	95% C.I.
None	1.28	1.00–1.63
Age, sex, race	1.45	1.10–1.92
Age, sex, race, baseline health[c]	1.55	1.07–2.23
Income	1.50	1.03–2.19
Access to medical care	1.49	1.03–2.16
Employment status	1.46	1.01–2.12
Education	1.53	1.06–2.21
Smoking	1.54	1.05–2.23
Alcohol consumption	1.52	1.05–2.20
Physical activity	1.47	1.01–2.12
Sleep patterns	1.53	1.06–2.22
Body mass index	1.60	1.11–2.32
All health practices	1.49	1.02–2.18
Marital status	1.52	1.05–2.20
No. of close friends	1.51	1.05–2.20
No. of close relatives	1.49	1.03–2.15
No. of close friends and relatives seen ≥1/month	1.51	1.04–2.18
Group membership	1.47	1.02–2.13
Religious group membership	1.57	1.09–2.27
All social network items	1.47	1.10–2.16
Depressive symptoms	1.52	1.05–2.20
Personal uncertainty	1.50	1.03–2.16

[a]Source: reference 6.
[b]Odds ratio from multiple logistic regression model.
[c]All subsequent models include adjustment for age, sex, race, prevalent high blood pressure, heart trouble, trouble breathing, and diabetes.

social, psychological, and health characteristics. While most of these individual measures were strong predictors of risk of death, the heightened risk of death associated with residence in the poverty area persisted with adjustment for these factors.

CENSUS TRACT CHARACTERISTICS AND MORTALITY

These results indicated that a characteristic of the area in which people lived was strongly associated with mortality risk, independent of a large number of risk factors measured at the individual level. However, what it is about the poverty

area that led to increased risk of death could not be examined in any detail in these analyses. In a further study, partially reported in Haan, Kaplan, and Syme (1), we tried to examine in more detail what some of these characteristics might be. These analyses used the entire Alameda County Cohort, and for measures of the areas in which people lived we used census tract characteristics. A principal components factor analysis of a large number of 1960 census tract characteristics was carried out, resulting in four scales (Table 3). Only characteristics that had a loading of 0.4 or greater on a scale were included, and in cases where a census tract characteristic loaded strongly on two scales, it was included in both. Table 3 shows the content of each scale and the Cronbach's alpha, a measure of internal consistency.

Scores for each census tract were calculated based on the factors and divided into deciles. Each participant in the Alameda County Study was then assigned a score of 1–10 for each scale based on the scale decile occupied by the census tract

Table 3

Census tract scales (Cronbach's α) and items

Scale	Items[a]
"Lower" (0.84)	Female blue-collar
	Male blue-collar
	Separated/divorced females
	Separated/divorced males
	Deteriorating housing units
	Black
"House" (0.79)	Dilapidated housing units
	Deteriorating housing units
	Housing units with no heat
	Housing units with no or shared bathroom
	Housing units with >1 person/room
"Old-Down" (0.87)	Males >65 yrs old
	Housing units with no or shared bathroom
	Housing units with no heat
	Widowed males
"Upper" (0.83)	Same residence as 5 yrs ago
	Some college education
	Owner-occupied housing units
	Drive car to work
	Employed males
	Median income (amount)

[a]Proportion in census tract with characteristic or median income.

in which he or she lived. Using an analytic strategy similar to that in the poverty area analyses, age-adjusted mortality rates were then calculated, with and without adjustment for individual-based measures. Figure 1 shows age-sex-race-adjusted mortality rates by quartiles for each scale. Generally, mortality increased monotonically with increasing quartiles. Alameda County Study participants who lived in census tracts in the top versus the bottom quartiles were at an 18–42 percent increased risk of death. Figure 2 shows the results of Cox proportional hazard analyses in which we adjusted for a wide variety of individual risk factors. There was very little confounding of the associations between the area scales and risk of death. Because it was possible that individual census tract characteristics were accounting for these associations, we examined each characteristic separately. Interestingly, individual characteristics were not importantly or significantly associated with increased risk. Instead, it is the clustering of these characteristics, as represented in the area scores, that is important.

CLUSTERING OF RISK FACTORS AND SMALL AREA VARIATIONS IN MORTALITY

The clustering of characteristics in areas has not been examined in any great detail by epidemiologists, probably because of the insistence on finding single "independent" effects. Are areas that evidence high levels of disease the same areas in which socioenvironmental risk factors cluster together? In order to examine this question, standardized mortality ratios (SMRs) were calculated for Alameda County zip code areas for 1984–1988 (7). As expected, there were large variations in mortality rates between zip codes. Impressionistically, the same patterns were found for men and women, for deaths at different ages, and for the major cause of death, excepting breast cancer. These patterns were then compared with risk factor information obtained in a random digit-dialing telephone survey, with oversampling of African Americans and Hispanics, of 3,047 adult residents of Alameda County in 1988–1990.

As a way of examining the relationship between these risk factors and the health status of the areas, we calculated the association between levels of particular risk factors and the odds of living in a high-SMR (top decile), low-SMR (bottom decile), or medium-SMR (2nd to 9th decile) area using a polytomous logistic equation with adjustment for oversampling. Those who were at higher risk on a wide range of demographic, behavioral, social, and health characteristics were significantly more likely to live in high-SMR versus low-SMR zip codes. Figure 3 indicates the odds ratios for living in a high- versus low-SMR zip code for a large number of characteristics.

To summarize the clustering of these risk factors and to make a link with the occupational stress literature, we divided the characteristics into lists of demands and resources (Table 4). After constructing simple count indices for the demands and resources, a 2 × 2 classification, with median splits of the demand and

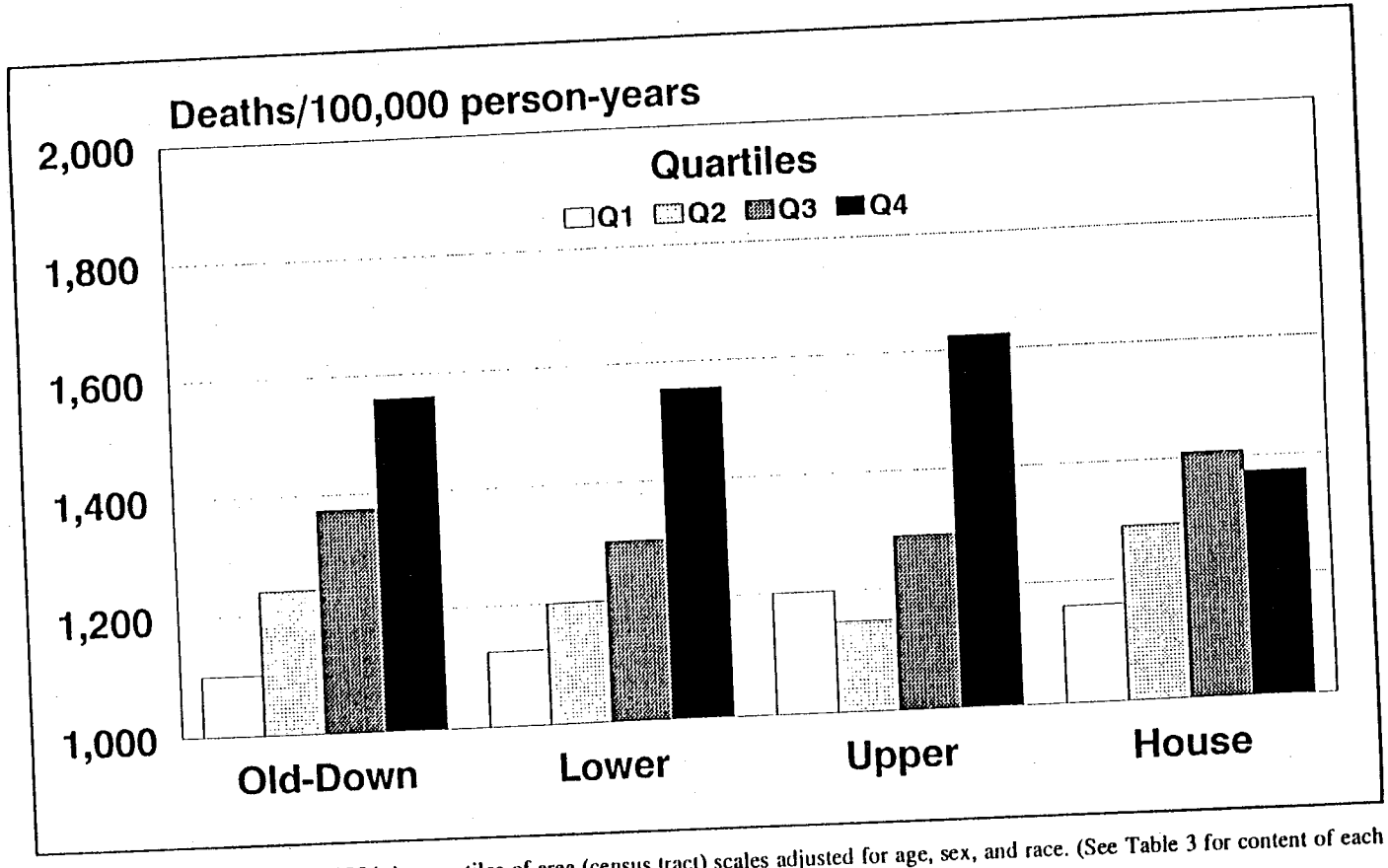

Figure 1. Death rates, 1965–1984, by quartiles of area (census tract) scales adjusted for age, sex, and race. (See Table 3 for content of each scale.)

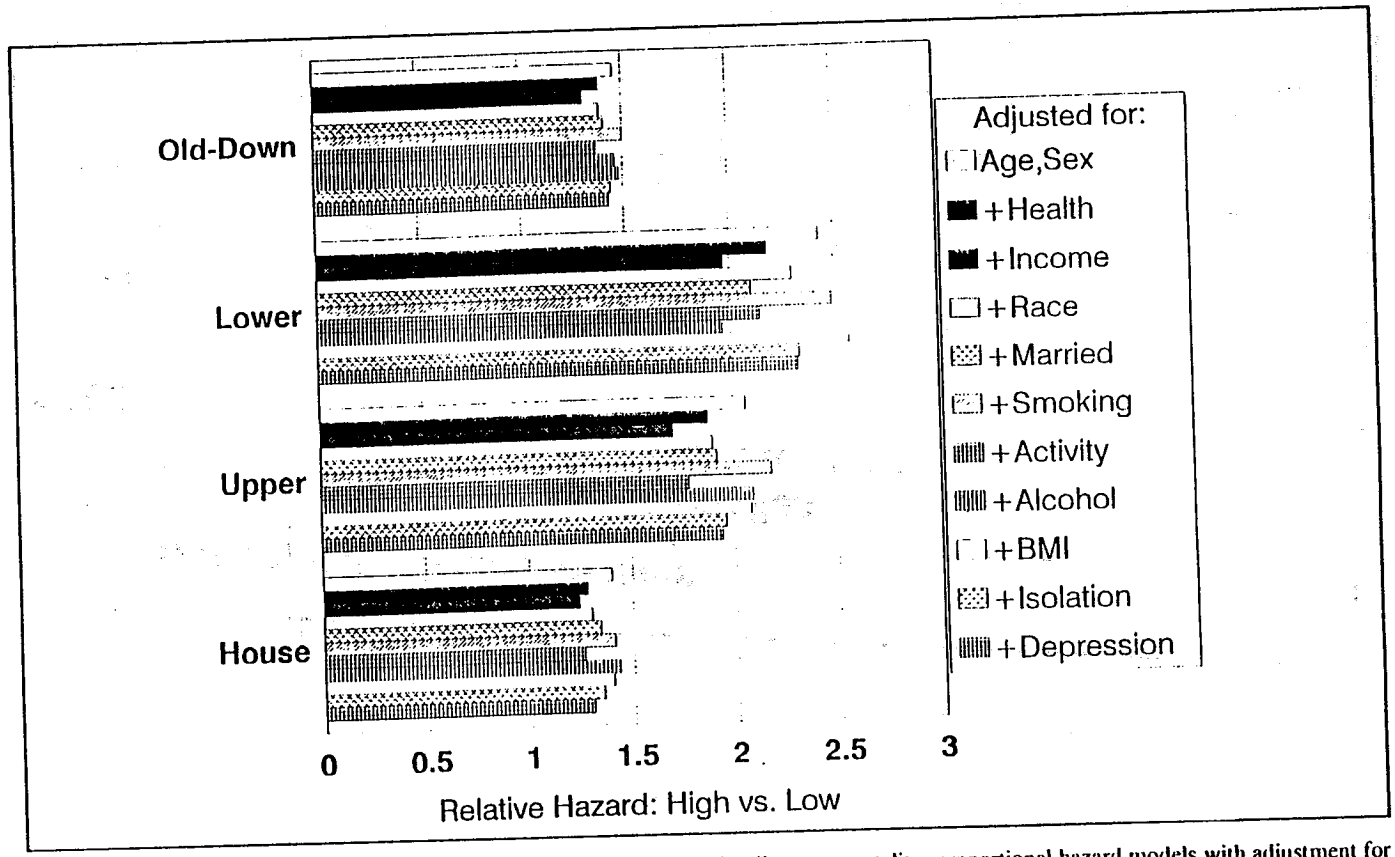

Figure 2. Association between area (census tract) scales and 1965–1984 all-cause mortality: proportional hazard models with adjustment for covariates (BMI, body mass index).

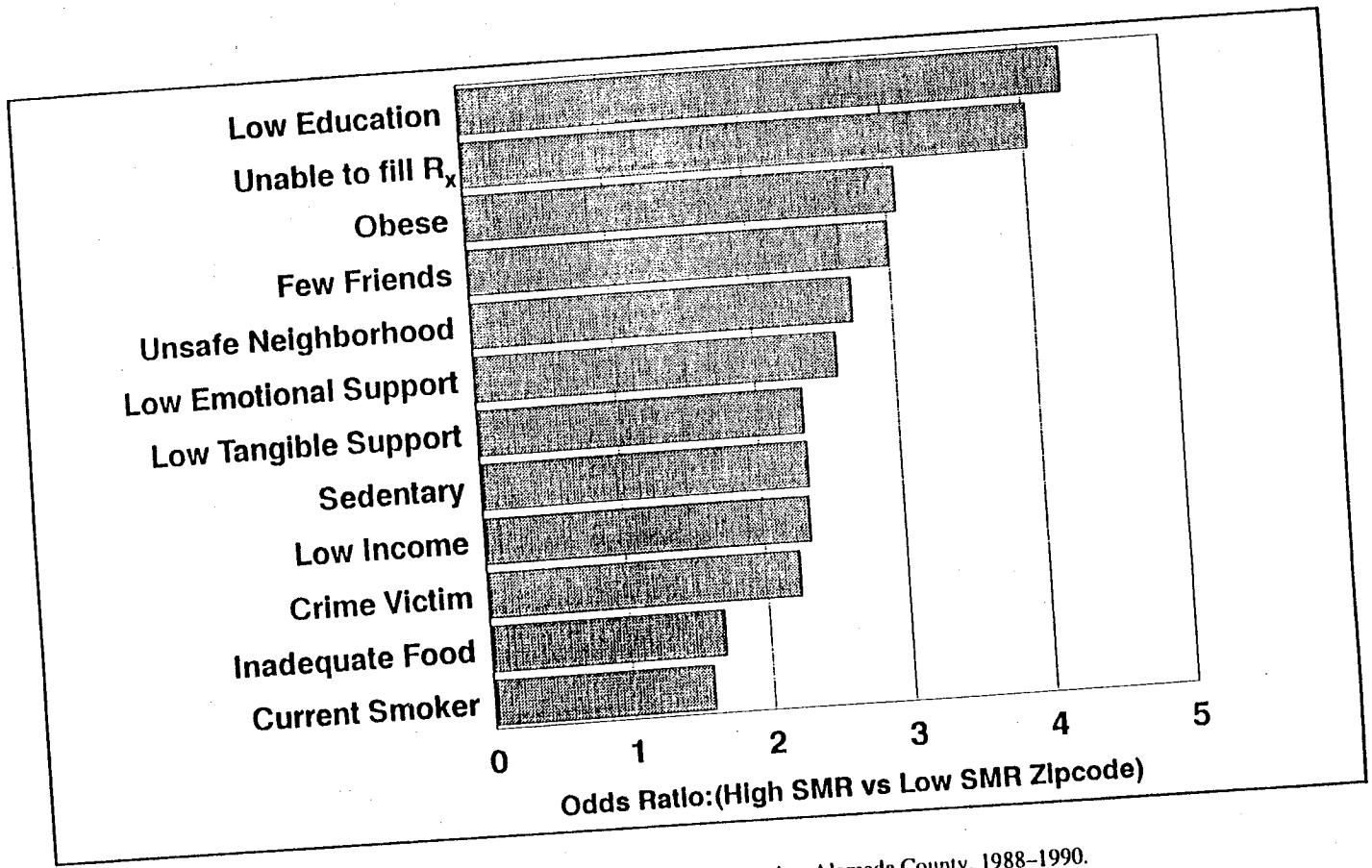

Figure 3. Factors associated with residence in high- versus low-SMR zip codes, Alameda County, 1988–1990.

Table 4

Demands and resources

Demands	Resources
Daily activity is hard	Daily activity involves decision making
Daily activity is repetitive	Daily activity involves control
Daily activity requires being fast	Top 60% of income distribution
Live in unsafe neighborhood	High school education or above
Crime victim in last 12 months	Some health insurance
Poor health	Two or more close friends or relatives
Inadequate money for food ≥1/month	One or more sources of emotional support
Inadequate money for medical care ≥1/yr	One or more sources of tangible support
Inadequate money to fill prescription ≥1/yr	

resource scales, was created in order to define four groups: high demands/low resources, high demands/high resources, low demands/high resources, and low demands/low resources. Those who reported high demands/low resources were 10 times more likely to live in high-SMR areas than in low-SMR areas (Figure 4).

SOCIAL CLASS AND THE HEALTH OF PLACES

How do these results relate to the discussion of the inverse association between social class and disease? Of some importance is the fact that the characteristics more prevalent in the high demands/low resources zip codes were also strongly associated with income level. Thus, areas of low social class are high strain areas in which there are clusters of characteristics that represent high levels of demands and few resources with which to deal with these demands.

These analyses only begin to hint at the value of moving from individually based conceptualizations of social class–disease associations to schemes that more fully describe variations in places by social class. Analyses by Sooman and Macintyre (8) indicate wide social-class-related neighborhood differences in amenities, problems, fear of crime, and neighborliness. Troutt (9), contrasting middle and low social class neighborhoods, found large differences in the types of stores available and the availability of markets. Sooman, Macintyre, and Anderson (10), comparing two neighborhoods with very different social class distributions in Glasgow, found that availability and pricing of healthy food was worse in the lower social class area. Criminologists noting the co-occurrence of high rates of delinquency, crime, infant mortality, low birth weight, tuberculosis, child abuse, and violent death (11, 12) in certain communities, sociologists studying child development (13, 14), and those interested in the plight of the

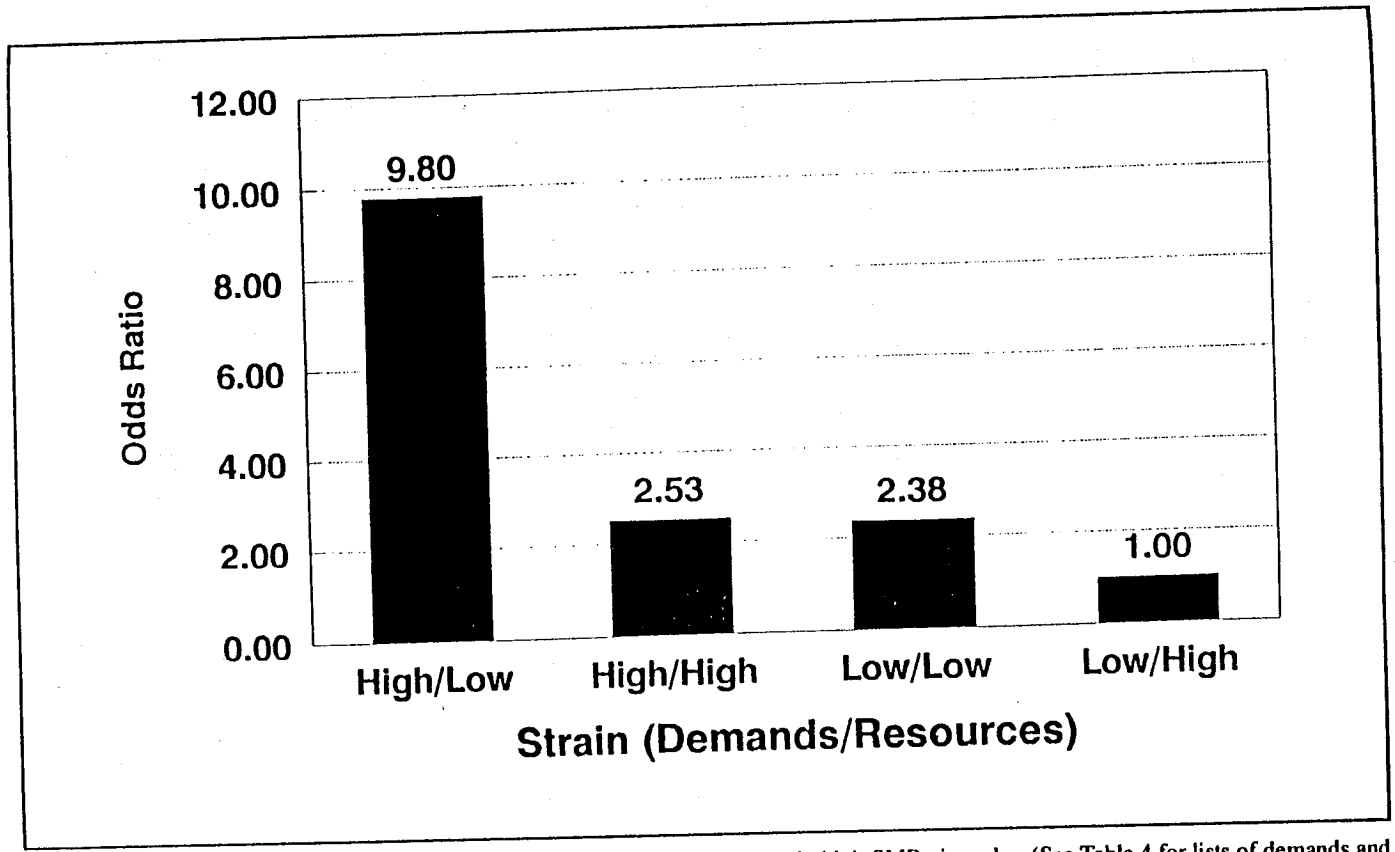

Figure 4. Association between levels of demands and resources and residence in high-SMR zip codes. (See Table 4 for lists of demands and resources.)

disadvantaged (15) have all turned to an examination of the role of neighborhood, community, and area factors. The results of these inquiries add plausibility to the assertion that studying the characteristics of where people live and how these vary by social class may help us to go upstream in our understanding of the impact of social class on health. However, considerably more work needs to be done to fully understand the ecologic niches in which people live. Such an understanding can help to guide an approach to reducing social-class-related inequalities in health that would be based more on community development than on traditional health promotion and disease prevention efforts.

Progress will require considerably more data collection on the daily experiences of individuals, on the material and symbolic demands that challenge them, on the personal and community resources available to meet these challenges, and on the macroeconomic forces that affect both the individual and community. Without such a research agenda it will be difficult to gain a better appreciation of the role of social class and socioenvironmental forces in shaping individual behaviors, beliefs, and biology.

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