A SPATIAL ANALYSIS OF CONTEXTUAL EFFECTS ON VOTER PARTICIPATION IN THE 1992 PRESIDENTIAL ELECTION

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While many of the pioneering voting studies recognized the importance of the local context in shaping electoral behavior, for the most part, analyzing contextual effects has been a neglected area of political science inquiry. In recent years, however, there has been a noticeable increase in the attention accorded the contextual dimension. Works by Huckfeldt, Books, Prysby and others have demonstrated how the local environment can operate as an independent force influencing political attitudes and behavior, including feelings of partisanship, voter turnout and ballot choice.

Adding to the renewed interest in studying contextual effects is the growing overlap in contemporary American society between geography and race. The close convergence which currently exists between geography and race, particularly within urban settings, has even given rise to a new term in the lexicon of demographers: hypersegregation. This term refers to the extreme concentration of minority groups, mainly blacks and Hispanics, living within compact spatial areas.

The sociological significance of hypersegregation has been spelled out clearly by Massey and Denton, who have examined this phenomenon extensively. The spatial isolation of minorities in certain urban areas in America has led to their withdrawal from the social and economic life of the larger society with deleterious consequences.

In line with the argument made by Massey and Denton, one would hypothesize that the local context created by the extreme residential segregation of minorities would have a powerful independent effect on their political attitudes and behavior. More specifically, one would hypothesize that minorities living within these residentially-segregated enclaves would have a uniformly lower level of political participation.

The overwhelming majority of studies examining contextual effects, including the works by Massey and Denton, utilize census-tract level data or even larger ecological units of analysis. The underlying assumption of these studies is that there is a high degree of uniformity in both attitudes and behavior among residents residing within census tracts sharing the same compositional characteristics and, conversely, considerable variability in attitudes and behavior among residents living in census tracts with differing demographic profiles.

In the present study we examine the level of political participation at a much smaller spatial unit of analysis than the census tract -- the census block -- in an urban setting. A major focus of the study will be to determine the degree of variability in level of political participation at the block level within tracts with heavy concentrations of minority residents. If contextual effects at the census-tract level are pronounced, we would expect to find a fairly high degree of consistency in the political participation rates of the blocks comprising the tract.

Setting

The unit of analysis employed in this study is the approximately 1100 census blocks in the City of Bridgeport, Connecticut. The City of Bridgeport has the largest population in the State and in many ways is prototypical of medium-sized cities in the Northeast region of the country. As late as the end of the 1950s, the City was a thriving manufacturing center but with the loss of its industrial base experienced serious economic decline. Like many other cities in the Northeast, its population is racially diverse. The 1990 Census reported a total population of 141,663 inhabitants with 65,694 (46.4%) non-Hispanic whites, 36,438 non-Hispanic blacks (25.7%) and 35,840 (25.3%) residents of Hispanic origin. Bridgeport also ranks among the top ten cities in the country with the highest proportion of residents with incomes below the poverty level.

Data

The data set in this study was drawn primarily from two separate sources. The voting data initially were

gathered at the individual level. A voter file was obtained which included the following data for each of the 61,718 registered voters in the City as of December 1992: name, address, date of birth, gender, party affiliation and federal voting precinct. Added to the voter file was a validated record of whether or not each registrant cast a ballot in 1992 presidential election.

A Geographical Information System (GIS) was employed to code each registered voter's address to its census block. In carrying out this task, the GIS system used a street address reference file for every street segment in the City of Bridgeport. The reference file for each street segment included the segment's census tract, block group and block. The GIS system then matched each registered voter's address against the reference file and, where a match was made, added the census tract, block group and block number to the voter's record. While a GIS matching process rarely succeeds in 100% of the cases, in this instance, the match rate was 98.6%.

Once the voters' records were geocoded, they were then aggregated up to the block level. This enabled us to calculate at the block level the following: the total number of registrants; the total number of registrants who voted; the average age of registrants and those falling within specific age categories; and finally the proportion of registrants enrolled as Democratic, Republican, and Unaffiliated.

At the next step in the process, 1990 census block data were merged with the aggregated block-level voting data. The census block variables which were selected for merging included the following: the racial composition of residents 18 years of age and over (non-Hispanic white, non-Hispanic black, Hispanic origin), percent of owner and renter occupied housing, median value of the owner-occupied housing, median value of the rent, and the population density of the block.

Finally, the GIS system was used to determine the physical distance between each block's centroid and the exact location of the voting place within the precinct.

Bridgeport: A Tripartite Racial City

The City of Bridgeport exhibits a high degree of residential segregation based on race. GIS maps shaded by the percent of each block which is white,

black and Hispanic (not presented) show that these three populations tend to live in distinct territorial enclaves within the City. Furthermore, the residential separation of the three major racial groups corresponds strongly with economic status. For example, there is considerable territorial overlap at the block level between percent owner-occupied housing and proportion of residents who are white.

It is also worthwhile to note that on two different dimensions of economic status -- the percent of owner-occupied housing and the median value of owner-occupied housing -- black residents display a relatively higher degree of "affluence" than Hispanic residents.

The tripartite racial nature of Bridgeport reflected in the GIS maps is also seen in the correlations at the block level between racial composition and socio-demographic characteristics and between racial composition and political participation. To gauge political participation, we utilized two separate measures: 1) the proportion of residents on a given block 18 years of age or older who were registered and 2) the proportion of the registrants who cast ballots in the 1992 presidential election.

An examination of the data in Table 1 underscores the importance of race in the City of Bridgeport. In terms of economic status, age and population density, race is clearly a delineating factor. Whites are more affluent, older and live on less-densely populated blocks. At the other end of the continuum are found the Hispanics who are poorer, younger and reside on blocks with higher population concentrations. Occupying the middle ground are the black residents in the City.

The relationship between race and political participation, though, is somewhat more ambiguous than that found between race and the previously discussed demographic characteristics. First of all, the correlations between race and the proportion of residents 18 years of age and older who are registered are weak. The correlations for whites, blacks and Hispanics are +.18, .00 and -.25, respectively. If the racial composition of a block was an overwhelming determinant, then we would expect to find the magnitude of the correlations to be significantly higher.

On the other hand, a strong relationship exists between racial composition and our other measure of political participation -- the proportion of registrants

who voted in 1992. There is a sizable positive correlation at the block level between the percentage of white registered voters and turnout in the 1992 presidential election (.672). Moreover, there is a moderately strong negative correlation between voting in 1992 and percent black (-.404) and a strong inverse correlation between voter turnout and the percent of Hispanic residents (-.612). Since there are distinct spatial areas in Bridgeport where each of the three major racial groups predominate, the preceding correlations would suggest high voter turnout in white areas and low voter turnout within black and Hispanic spatial areas of the City.

To provide a visual display of registration and voting patterns the GIS system was used to generate two maps of the blocks in the City of Bridgeport. The first map was thematically shaded by the proportion of those 18 years of age and over on each block who were registered (see Map 1). As expected, the map shows only a moderate degree of correspondence between census tracts primarily populated by one racial group and voter registration. What is noteworthy, though, is the striking variability in registration among blocks within the same census tract -- whether these tracts be composed mainly of white, black or Hispanic residents. Moreover, in several census tracts with large minority populations there is a high incidence of blocks with registration rates exceeding 75 percent.

A second GIS map was also generated which was thematically shaded by the proportion of registrants who voted in 1992 (not shown). While this second map provides clear-cut evidence of the overall relationship between racial geography and turnout, it also reveals variability in turnout within areas with large minority populations.

Registration and Turnout Variability in Highly Segregated Areas

To examine in greater detail the extent of variability in registration in minority areas we undertook a two-step analysis. First, a stepwise multiple regression analysis was performed using percent registered as the dependent variable and the socio-demographic variables and spatial characteristics listed in Table 1 as the set of predictor variables. (The race variables included in this analysis were the percent white and percent Hispanic living on each block).

The results of this analysis affirm the importance of both race and economic status in influencing voter

registration. The model explains 34% of the variance in registration among the blocks in Bridgeport. Next, we generated a list of the "outlier" blocks, using the standardized residual scores as our basis of classification. This list consisted of blocks with both higher-than-expected registration based on the regression model (the top 10% of the residual scores) and blocks with lower-than-expected registration based on the regression model (the bottom 10% of the residual scores).

If the local context is an important factor, particularly in "hypersegregated" areas, we would expect to find a relatively low number of blocks with positive outliers. The map of the outliers is displayed in Map 2. A glance at the map show that these uniformly distributed throughout the city. Importantly, a disproportionate number of these positive outliers are found in areas with a high concentration of minority residents.

Two areas which explicitly illustrate the above phenomenon are Census tract 744 which has a population of 80.7% non-Hispanic black and Census tract 741 which has a Hispanic population of 71%. In both these areas we find a relatively high incidence of blocks with higher-than-expected registration. Thus, even when introducing controls for the economic status of a block, we find a considerable number of blocks within predominately minority census tracts which are characterized by higher-than-expected registration.

A similar two-step analysis was also undertaken using voter turnout in the 1992 election as the dependent variable. This analysis (using the same set of predictor variables) produced a model explaining 50% of the variance in turnout among the blocks in Bridgeport. A map of the outliers (not shown) reveals that in several of the census tracts with heavy concentrations of minority residents there are numerous outliers indicating both higher- and lower-than-expected turnout in close physical proximity to one another.

Discussion

A number of implications flow from the results reported in this study. First, there is clearly a strong convergence between race and geography in Bridgeport as found in many other northeastern cities.

Furthermore, the geography of race is also linked with other key demographic variables such as economic status and population density. However, caution must be exercised not to view the racial composition of an area as being determinative of the attitudes and behavior of all residents living in that area. A major finding in the preceding analysis is that even in "hypersegregated" minority areas, there is noticeable variability in both voter registration and turnout. This is not to suggest that the local environment does not have a significant bearing on political participation but it is to suggest that the magnitude of this influence may not be as great as other studies have posited.

From a methodological point of view, this study illustrates the utility of using a GIS system to examine behavioral science data. First the GIS system facilitates the use of smaller ecological units than have traditionally been employed in social science analysis. Second, the GIS system permits the researcher to identify meaningful geographical configurations which might otherwise escape detection.
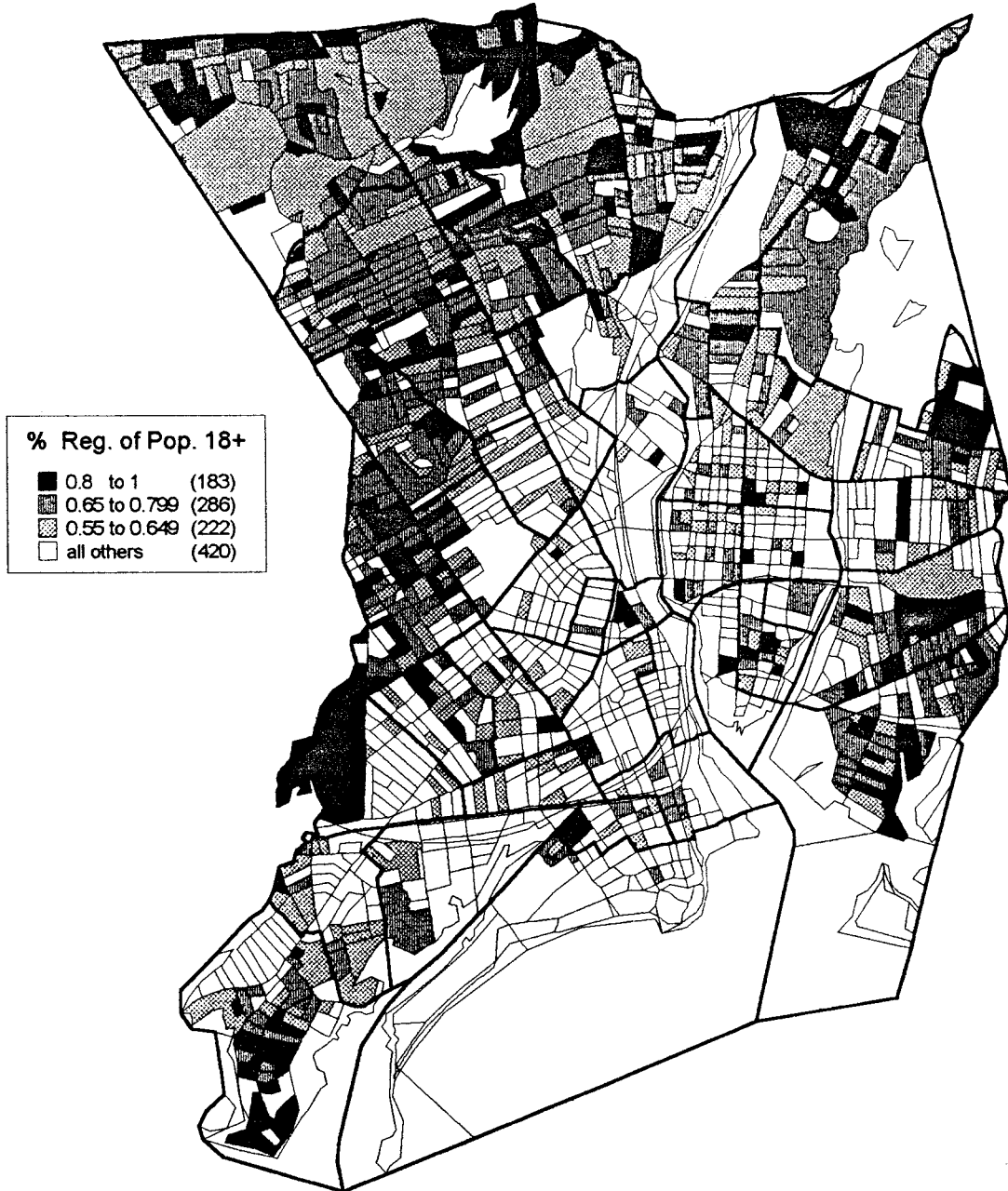
Table 1

Correlation Coefficients - Bridgeport Blocks

Race	% White	% Black	% Hispanic
% Black	-.777**		.133*
% Hispanic	-.708**	.133*	
Socio-Economic Status			
% Owner Occupied Housing	.431**	-.173*	-.477**
Median Value - Owner Occupied	.355**	-.232**	-.319**
Median Rent - Renter Occupied	.215**	-.184**	-.137*
Age			
% Registered - Under 30 yrs	-.483**	.238**	.469**
% Registered - Over 60 yrs	.485**	-.351*	-.360**
Spatial Characteristics			
Density - Pop/ Sq.Mi.	-.499**	.232**	.517**
Distance to Voting Location	-.183**	-.075	-.197**
Electoral Participation			
% 18+ - Registered	.183**	.002	-.252**
% Registered - Voted 1992	.672**	-.404**	-.612**

2-tailed significance: * -.01   ** - .001

Map 1

% Registered of Population 18+

% Reg. of Pop. 18+

■	0.8 to 1	(183)
▨	0.65 to 0.799	(286)
▨	0.55 to 0.649	(222)
□	all others	(420)

Map 2

% Registered of 18 yrs +
Standardized Residuals

Standardized Residuals

■	1.28 to 4.7347	(91)
■	-4.33061 to -1.2	(101)
□	all others	(1329)

Tract 744
81% Black

Tract 741
71% Hispanic