NEIGHBORHOOD AND COMMUNITY CONTEXT EFFECTS ON VOTER TURNOUT; A CASE STUDY IN BALTIMORE, MD AND BRIDGEPORT, CT

Kurt Schlichting, Fairfield University, Peter Tuckel, Hunter College, Richard Maisel, New York University
Kurt Schlichting, Fairfield University, Fairfield, CT 06430

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Since the pioneering work of Herbert Tingsten, a large number of studies have been undertaken concerning the effect of context on voting behavior. These studies have demonstrated the impact of social context on several facets of voting behavior including strength of partisan identification, the direction of the vote, and voter turnout. Almost all of these studies adhere to a similar methodology. A contextual variable (C) is introduced into an analysis consisting of one or more individual level independent variable(s) [X(s)] and one individual level dependent variable (Y). For example, Tingsten's classic study examined the effect of the social class composition of voting districts (C) on the relationship between individual level socio-economic class (X) and the partisan direction of the vote (Y) in Sweden (1937). Workers in Sweden were more likely to vote for parties on the left if the workers themselves resided in predominantly working class districts.

A second characteristic of contextual studies is that they often are based upon fairly large ecological units. For example, Wright's classic study of voting behavior among southerners in the 1968 presidential election found that whites were more likely to vote for George Wallace if they lived in counties (C) with high proportions of black residents. The most commonly used unit of analysis for specifying contextual effects in the United States is the census tract. As researchers who undertake contextual analysis readily concede, using a large ecological unit such as the county or even the census tract to measure contextual effects rarely suits their ideal research objectives. This is an important limitation because contextual analysis rest upon the underlying assumption that the compositional characteristics of the ecological unit employed are homogeneous in nature.

The present study departs from traditional contextual analyzes in two significant ways. First, to measure contextual effects we employ a multi-factor model rather than a single factor such as neighborhood social class or the racial composition of the county. Just as multivariate analyzes at the individual level capture the complexities of relationships more so than simple bivariate analyzes, the same logic can be applied to contextual dimensions. That is to say, a multi-factorial model of the social context is more sophisticated than one which is measured by a single factor alone.

A second departure is that we ourselves create the boundaries of the ecological unit to measure context. A special computer algorithm is used to construct geographical units which more closely align with the study's research specifications.

This paper presents two cases studies which examine the effect of context on voter turnout. The first case study investigates contextual influences on voting participation in a large-size city (Baltimore, Maryland) and the second in a medium-size city (Bridgeport, Connecticut).

The unit of analysis in both studies is the census block group which is considerably smaller than the typical census tract. The basic approach we adopt in both case studies is to examine the impact of a set of socio-demographic factors measured at two different spatial units on voter turnout at the block group level. The socio-demographic factors are derived from a wide range of census variables at the block group level. These factors are first calculated for the census block group and then calculated for a wider geographical area surrounding each block group. These areas are constructed by means of the aforementioned computer algorithm program which draws a radius of .75 miles around each block group and aggregates the socio-demographic factors up to this larger areal unit. Finally, we measure the interaction effect of this set of socio-demographic factors operating at these two distinct geographic levels on voter turnout at the block group.

The reason for calculating the factor scores at two geographically distinct levels is that most studies of contextual analysis define the geographical scope of the context they are using in imprecise terms. They often use the census tract as a surrogate measure for the "neighborhood" or the "community" without ever drawing a distinction between the two. Our purpose is to distinguish between the immediate contextual effects of the "neighborhood" (operationally defined here as the block group) versus the larger contextual effects of the "community" (operationally defined here as the radial area surrounding the block group).

Case Study Number One -- Baltimore, Maryland Setting

As mentioned above, the unit of analysis employed in this first case study are the census block groups in the City of Baltimore, Maryland (n=865). According to the 1990 Census, the City of Baltimore ranks 13th in the country in terms of its population size. Racially-speaking, 59.2 percent of its population is non-Hispanic black and 39.1 percent is non-Hispanic white. Only 1.5 percent of its inhabitants are of Hispanic origin and only 3.2 percent in toto are foreign-born. Importantly, Baltimore is classified by social demographers as "hypersegregated" (see Map 1) (Massey and Denton, 1993).

Data and Method

The first step in the methodology was to obtain a voter file for the 327,246 registered voters in the City of Baltimore. The voter file included a voter history for each individual which indicated whether or not he/she had participated in the general elections occurring in the years 1988, 1990, 1991 and 1992 as well as in the primary elections held in each of these years.

A Geographical Information System (GIS) was then employed to assign each registered voter's address to its census block group. GIS can be used to first geocode individual data records and then the geocoded records can be aggregated up to any level of census geography. In this study, the geocoded records were aggregated up to the census block group level.

After the voters' records were geocoded and aggregated up to the block group level, the following variables were calculated for each block group in the City of Baltimore: the total number of registrants and the total number of registrants who voted in each election. We then calculated two measures of political participation -- an average measure of turnout for the general elections in 1988, 1990, 1991, and 1992 and a comparable measure for the primary elections in those same years. Turnout in both cases was calculated by dividing the number of people who voted in a given election year by the total number of people eligible to vote (according to the 1990 Census) and then averaging the results. Based upon a series of elections, these two measures of turnout are more stable than turnout measures for a given individual year which might be more susceptible to idiosyncratic influences.

At the next step in the process, a factorial ecology model was developed to specify neighborhood and community contexts. Social contexts do not consist of a single dimension but are mutifaceted. Urban geographers, for example, have long recognized the complexity of the socio-economic and socio-cultural nature of spatial areas within urban aggregates. To capture the complexity of context a multi-dimensional analytical technique is needed.

Factorial ecology employs principal components factor analysis with a large selection of social, demographic, and housing variables to characterize the spatial areas within cities and these form "the basis for reliable high-level generalizations about urban sociospatial structure" (Knox, 1995). The goal of a factorial model is to examine the underlying structure of socio-economic differentiation within the urban complex; in other words, to determine the nature of context.

The present research replicates an earlier factorial ecological model for Baltimore, Maryland which utilized twenty input variables at the census tract level. This previous analysis revealed four underlying factors; "underclass", "socio-economic status", "youth/migrants" and "black poverty" which collectively accounted for 72.2% of the cumulative variance (Knox, 1995).

In the present study we used the same twenty variables with the addition of a mobility measure (percent living in the same residence in 1990 as in 1985). Our ecological factor analysis produced five significant (eigenvalue > 1.0) factors. As Table 1 shows, the first factor is positively associated with the following variables: percentage of "never married", rental housing, single parent households, and poverty. This factor is strikingly similar to the "underclass" factor uncovered by the Knox analysis at the tract level for 1980. The variables which loaded high on the second factor were the percent college educated, percent professional, and median family income -- all in the positive direction -- and the percent people employed as operatives in the negative direction. This dimension reflects occupational status and conforms once again to the model produced by Knox. An examination of the loadings on the third, fourth, and fifth factors suggests these might be termed "ethnic status," "households without children", and "substandard housing," respectively.

The factor scores on these five factors were used as measures of the different contextual influences operating at the block group level. These measures can be thought of as indicative of "neighborhood" contextual effects. They measure the impact of a diverse set of contextual influences working at a close, proximate level. The

relatively small spatial size of the block group allows for the isolation of "neighborhood" effects.

To measure contextual influences operating at a wider geographic area, we then generated a set of parallel factor scores for a larger areal unit around each block group. To accomplish this task, we relied upon a specially-designed, computer-based radius program. This program draws a geographic radius of any specified distance around units of census geography such as the block group. The program incorporates, for example, any block group whose centroid falls within the designated radius. Once the radial distance has been established, the program aggregates the factor scores for all of the block groups falling within its geographic scope -- excluding the block group at the center. After this step has been completed, the aggregated factor scores are weighted by the total population size of the circumscribed area.

In this case, the program was used to draw a .75 mile radius around each of the approximately 800 block groups in the City of Baltimore. The distance of .75 miles was chosen because its geographic coverage obviously extends beyond the block group and, we argue, captures a sense of the larger "community." Thus, these weighted factor scores for the radial unit can be viewed as measurements of contextual influences operating at the "community" level.

Once both the "neighborhood" and "community" contextual measures were derived, we performed a hierarchical multiple regression analysis modeling the influence of these effects on voter turnout. Our dependent variable was a composite measure of turnout in Baltimore. It was calculated by dividing the total number of votes cast in four separate elections (1988, 1990, 1991, and 1992) by the total number of eligible voters (according to the 1990 census) for each block group and then averaging these four ratios. The first set of independent variables which were entered into the regression equation were the five "neighborhood" (block group) factor scores. The second set of independent variables which were introduced into the equation were the parallel set of five factor scores at the "community" (.75 radial unit) level. Finally, to measure the "neighborhood" - "community" interaction effects, we constructed five multiplicative terms, multiplying the five "neighborhood" factor scores times their respective "community" factor scores. This last set of variables was then entered into the equation.

Results

The results of the multiple regression analysis are presented in Table 2. The results show, first of all, that the model explains over half of the variance (.55) of turnout among the 804 block groups included in the analysis. A substantial proportion of this explained variance (almost 90%) is attributable to the main effects operating at the "neighborhood" level. The beta weights associated with each of the five "neighborhood"-level factors indicate that Factor 1 ("underclass") and Factor 2 ("occupational status") exert the greatest influence on voter turnout. Factor 4 ("non-family households") also exerts a modest influence and Factor 5 ("deteriorated housing"), which has a low-value beta weight, is, nonetheless, significant.

The additional proportion of variance explained in voter turnout by the main effects (taken together) at the "community" level is also statistically significant ($p<.05$). Three of the five individual factors at this level achieve statistical significance, with factor 2 ("occupational status") having the highest beta weight value.

Importantly, the "neighborhood"-"community" interaction effects also make a statistically significant contribution to the proportion of variance explained in the dependent variable. Factors 1, 2, 3 all achieve significance at the .05 level.

These findings indicate that contextual influences on voter turnout are complex and not confined to single dimensions. A number of different factors appear to operate simultaneously as contextual variables. Furthermore, the contextual effects appear to be most pronounced at the immediate, "neighborhood" level. However, both "community" level and "neighborhood"-"community" interaction effects also play a role in explaining the variability in vote turnout.

Map 2 overlays the factor scores on Factor 1 ("underclass") over voter turnout at the block group level. The map also identifies the predominately black residential areas (labeled A,B,C,D). Two findings are particularly noteworthy. First, while block groups with high factor scores on the "underclass" dimension are concentrated within the predominately black residential areas, a sizable proportion of the block groups within the black residential areas do not have high values on this factor. This explains visually why the "proportion black population" had only a moderately high loading on the "underclass" factor. The block groups with high values on the "underclass" factor are clustered within two areas

in the center of Baltimore. Second, there is a strong ecological association between the "underclass" dimension and voter turnout. High values on the first variable are linked with low values on the second.

Case Study Number Two -- Bridgeport, Connecticut Setting

The unit of analysis employed in this second case study is the approximately 140 census block groups 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 size 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 and Method

The methodology in this second case study closely paralleled that of the first case study. First we conducted a factor analysis on the same set of census variables and generated factor scores. We than employed the radius program to delineate community areas in a .75 mile radius of each block group and aggregated the factor scores up to these areal units. Again, we conducted a hierarchical multiple regression analysis using there sets of variables: (1) the "neighborhood" factor scores, (2) the "community" factor scores (at the .75 radial unit), and (3) the "neighborhood"-"community" interaction terms. One departure from the Baltimore study was the measurement of voter turnout, the dependent variables. Here, the measurement was based upon just the 1992 general election and was constructed by dividing the number of votes cast in that election by the number of eligible voters (according to the 1990 census) at the block group level.

In this analysis there were six factors with eigenvalues exceeding 1.0. What is perhaps most striking, though, is the basic similarity in the factor structure based upon the factor loadings. Again, the first factor reflects a poverty dimension, although it is linked with Hispanic population. This is due to the fact that, overall, of the three major racial groups in Bridgeport, Hispanics occupy the lowest economic status. Once again, the second most important factor reflects occupational status. The model explains a high proportion of the variability in voter turnout at the block group level ® Square = .70). Almost all of the variance explained is at the "neighborhood" (block group) level. Of the six factors at this level, four reach statistical significance, with factor 1, "Hispanic-underclass", being the most prominent factor. None of the individual factors at the "community" level are significant; however the "community" level factors, taken together as a block, make a significant contribution to the variance explained. Finally, the interaction terms, both individually and as a group, are not significant.

Conclusions

A number of major findings have emerged from this study. First, this study provides empirical evidence of the complexity of contextual influences. The results of the factor analyzes in both Baltimore and Bridgeport reveal the presence of several contextual factors operating simultaneously as influences on voter turnout. The factor analysis in Baltimore, for example, generated five independent contextual dimensions and the Bridgeport analysis, six. This suggests that contextual analyses which rely upon one single contextual variable may by inadequately specifying the influence of the social environment on political behavior.

A corollary finding is that the structure of the factor analysis generated in the two cities was fairly similar. In both cities, an underclass factor was the dominant factor and occupational status was the next most important dimension. Significantly, in both cases studies contextual factors operating at the neighborhood level exerted the greatest influence on voter turnout. At least with respect to political participation, it appears that the immediate "neighborhood" environment plays a more important role than the larger "community". While both the "community" contextual dimensions and the "neighborhood"-"community" interactions in Baltimore did have some impact, their effects were of considerably lower magnitude.

Finally, we discovered that the contextual interaction effects were significant in Baltimore but not in Bridgeport. It is clear that in Baltimore the combined effect of both the immediate "neighborhood" and the surrounding "community" is an important determinant of voter participation. This same joint effect though, is absent in Bridgeport. We suspect the reason for this is related to the relative difference in size of the two cities. In Bridgeport which is a much smaller city, the block

group may already encapsulate both neighborhood and community effects. Future research should examine the relationship between the size of a city and the meaning of neighborhood and community context.

References

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Table 1 Baltimore, MD: Factorial Model - 1990 Block Groups

A. Explanatory Power of Factors

Factor	Percent	Cumulative	Eigenvalue
1	27.3	27.3	5.7
2	14.7	42.0	3.1
3	7.4	49.3	1.5
4	6.6	55.9	1.4
5	5.8	61.7	1.2

B. Factors Loadings

1	"underclass"	% never married	.829
		% rental housing	.808
		% single parents	.750
		% families below poverty	.706
		% vacant housing	.657
		% unemployed	.545
2	"occupational status"	% college education	.895
		% prof. & adm.	.879
		% operatives	-.752
		med. family inc.	.696
3	"ethnic status"	% Italian ethnicity	.710
		sex ratio	.674
		% black	-.590
4	"non-family households"	% 65 years & >	.710
		% 19 - 30 years	.634
		% housing 2 or > bedrooms	-.615
5	"substandard housing"	% lacking complete kitchen facilities	.813
		% lacking complete plumbing	.706

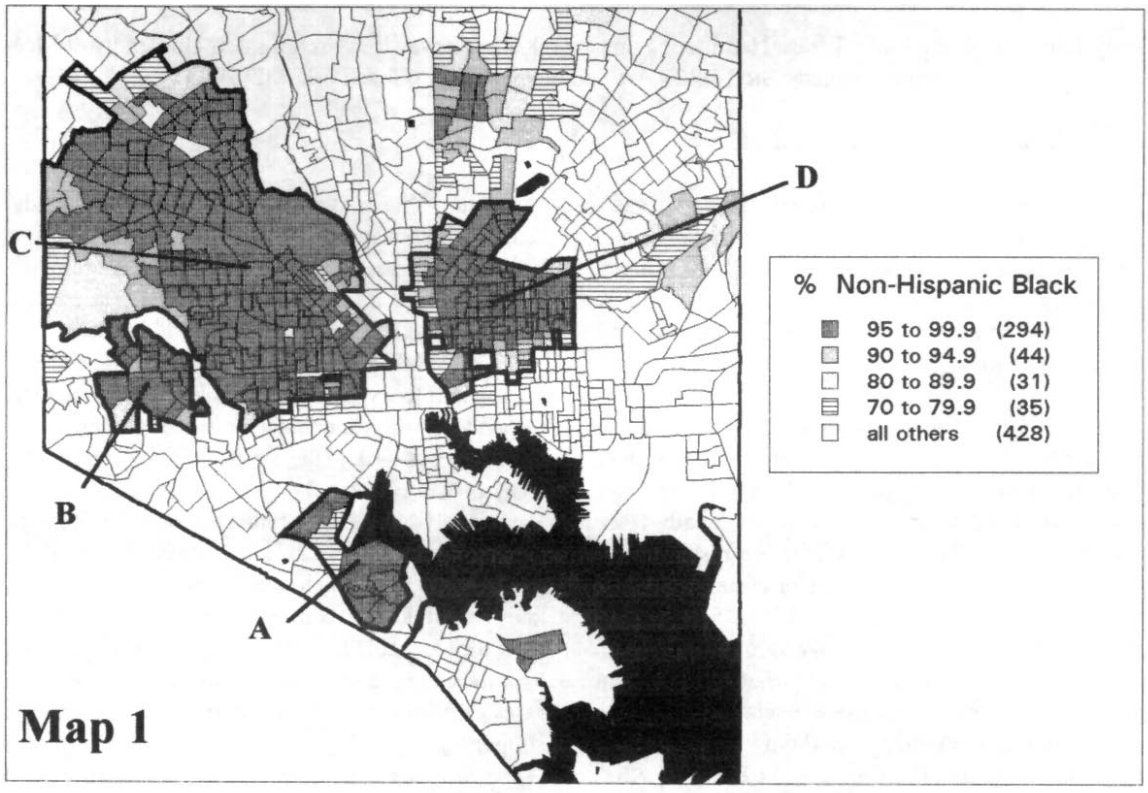
Table 2 Regression Model - Baltimore

Final Statistics

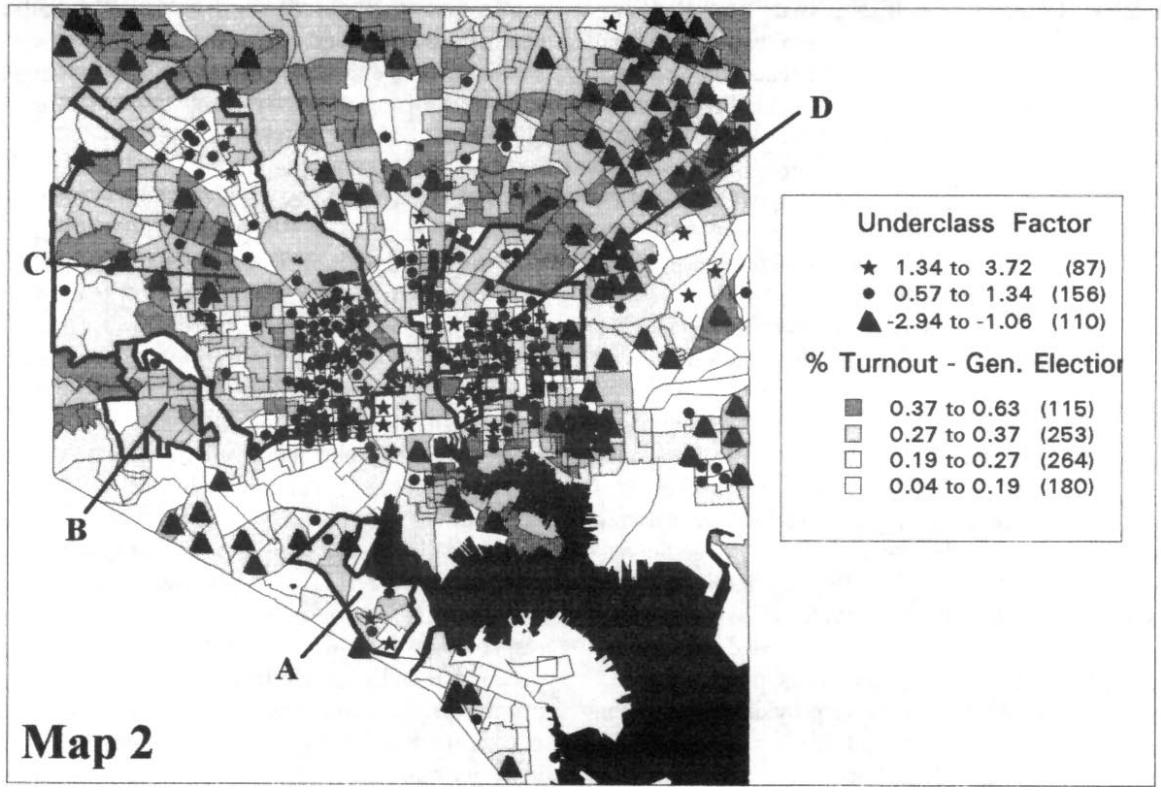
Multiple R .741 R Square .549

Dep. Variable average % turnout of eligible general elections:88 ,90 ,91, 92

Variables		**Beta**	**T**	**Sign. T**
Main effects - neighborhood (block group)				
Factor 1	"underclass"	.582	-15.887	.0000
Factor 2	"occupational"	.343	10.151	.0000
Factor 3	"ethnic"	-.056	- 1.844	.0655
Factor 4	"non-family"	-.213	- 6.482	.0000
Factor 5	"substandard"	-.052	- 1.966	.0496
Main effects - community (.75 mi. radius)				
Factor 1	"underclass"	.081	2.306	.0214
Factor 2	"occupational"	.244	6.630	.0000
Factor 3	"ethnic"	-.084	- 2.617	.0090
Factor 4	"non-family"	-.057	- 1.855	.0640
Factor 5	"substandard"	-.030	- 1.035	.3010
Interaction - neighborhood x community				
Factor 1	"underclass"	.101	3.554	.0004
Factor 2	"occupational"	-.122	- 3.966	.0001
Factor 3	"ethnic status"	.123	4.807	.0000
Factor 4	"non-family"	-.051	1.402	.1612
Factor 5	"substandard"	-.021	.800	.4242
Constant			59.415	.0000


A
B
C
D
% Non-Hispanic Black
95 to 99.9 (294)
90 to 94.9 (44)
80 to 89.9 (31)
70 to 79.9 (35)
all others (428)

Map 1


A
B
C
D
Underclass Factor
1.34 to 3.72 (87)
0.57 to 1.34 (156)
-2.94 to -1.06 (110)
% Turnout - Gen. Electio
0.37 to 0.63 (115)
0.27 to 0.37 (253)
0.19 to 0.27 (264)
0.04 to 0.19 (180)

Map 2