Group Size, Heterogeneity, and Intergroup Conflict: A Test of Blau's Inequality and Heterogeneity

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Abstract

Two theorems derived from Blau's recent macrosociological theory of social structure are tested with data on intergroup criminal victimization in the United States. The data base is taken from the National Crime Survey (NCS) national sample for the years 1973 to 1978. The theoretical predictions tested are that (1) the relative size of the same group in different neighborhood contexts is inversely related to extent of outgroup victimization; and (2) neighborhood heterogeneity is positively related to rates of intergroup victimization. These predictions are tested with data on the interpersonal crimes of rape, robbery, assault, and larceny for two major parameters in Blau's theory—race and age. The results support the hypotheses and show that while ingroup victimization is highly prevalent in the United States, interracial and interage criminal encounters are strongly and positively related to neighborhood heterogeneity.

Peter Blau's *Inequality and Heterogeneity* has been hailed as a "theoretical masterpiece" (Catton, 698) and as "one of the most important theoretical works ever written in sociology" (Turner, 704). Notwithstanding some critical reviews (e.g., Bell), it is evident that Blau's theory will stimulate considerable research. The theory is stated in explicit propositional form, and is applicable to many different levels of analysis (e.g., nation, state, city, community) and diverse sociological phenomena (e.g., division of labor, social mobility, intergroup associations). Moreover, Blau's macrosociological theory is a deductive system in which theorems about the implications

of structural conditions for social relations are logically derived from primitive assumptions and definitions. Tests of Blau's empirical propositions thus bear on a larger body of abstract theory.

Despite the acclaim Blau's theory has received, it has actually been subjected to relatively little direct empirical testing. For example, one of the few tests of the theory to date is the examination by Blau et al. of the theorem that heterogeneity increases intermarriage. Their analysis generally supported the theory and showed that while ingroup marriages prevail in the United States, heterogeneity is positively related to rates of intermarriage. However, theorems regarding other forms of social association such as intergroup conflict have not been examined. Many of the assumptions and predictions of the theory have thus gone unchallenged.

The objective of this paper is to further empirical testing of Blau's theory by examining two theorems that predict effects of group size and heterogeneity on intergroup conflict between victim and offender. After examining the prevalence of ingroup criminal encounters in the United States, I will examine how variations in the relative size of two kinds of groups, race and age, are related to rates of outgroup victimization and how differences in heterogeneity are related to intergroup victimization. Before describing the research procedures, I will present a brief exposition of Blau's theory.

Theoretical Background

In *Inequality and Heterogeneity* Blau presents a macrosociological theory that focuses on the effects of social structure on people's associations with other people. In Blau's framework the integration of various groups in society rests on the intergroup bonds established in the direct association between persons belonging to different groups. Social associations are important, then, because according to Blau the integration of social structure depends on face-to-face contact and interaction, not on functional interdependence or value consensus. In contrast to cultural and psychological interpretations, Blau's theory is grounded in a quantitative conception of social structure. The elements of social structure are the various social positions people occupy which influence social relations. Thus, what Blau refers to as social structure is simply the distribution of a population among differentiated social positions. Theoretical attention centers on how variations in the number of groups in a given dimension and variations in their size resulting from the population distribution among them affect intergroup association.[1]

Blau outlines the consequences of two generic forms of differentiation in social structure: heterogeneity and inequality. Heterogeneity (horizontal differentiation) refers to the distribution of a population among

groups in terms of a nominal parameter (e.g., race, sex). Inequality is the status distribution of people in terms of a graduated parameter (e.g., income, age). Heterogeneity is operationally defined as the probability that two randomly chosen persons do not belong to the same group. In terms of a dichotomy, heterogeneity is maximized when each group represents 50 percent of the population. Since social associations depend on opportunities for contact, the greater the heterogeneity the greater the chances that fortuitous social contacts involve members of different groups. Thus, a central theorem is that increasing heterogeneity increases the probability of intergroup relations.

As Blau et al. note, the heterogeneity theorem is of most interest when ingroup relations predominate and heterogeneity acts as a counterforce that mitigates prevailing ingroup tendencies. Therefore, a crucial and falsifiable assumption of the theory is that ingroup relations exceed chance expectations. According to Blau et al., the theorem that heterogeneity promotes intergroup relations implies that the structural constraints in heterogeneous communities counteract the ingroup tendencies even of salient parameters such as ethnicity. For example, although intra-ethnic marriage is highly prevalent in the United States, Blau et al. found that ethnic heterogeneity increases rates of interethnic marriage. Thus, Blau's theory is not simply concerned with events that conform to chance expectations, but with the extent to which variations in social structure modify factors promoting intragroup bonds (e.g., cultural values, physical distance).[2]

Although Blau is concerned with the macrosocial integration of various groups into society he also explores conflict. Indeed, conflict is simply one form of social interaction, and it is often kindled by the association of people in distant social positions. The same structural conditions that make cordial intergroup relations more likely also make interpersonal conflict between members of different groups more likely. Blau explains this seemingly paradoxical situation:

For conditions that increase the probability of social contact increase the likelihood of overt interpersonal conflict as well as that of harmonious social associations, since both depend on opportunities for social contact. Strangely, therefore, the very conditions that foster the social integration of various groups and strata into a coherent social structure simultaneously precipitate frequent interpersonal conflicts among members (113).

Blau defines interpersonal conflict as "overt conflict between individuals involving direct interaction," for example when "the criminal forces his victims to hand over their money" (112). He distinguishes interpersonal conflict from internal mental conflict, conflict of interest, civil litigation, and group conflict. The focus of attention is on overt interpersonal conflict that entails direct contact (e.g., robbery, assault).

Research Framework

This study is concerned with the implications of one nominal parameter—race—and one graduated parameter—age—for intergroup victimization. Specifically, it examines the influences of the comparative size of race and age groups[3] and of the heterogeneity of areas on intergroup victimization. In conflict between two groups the ratio of the number of dyadic outgroup contacts per group member (either as victim or offender) is the inverse of the group's relative size. As Blau et al. note, the reason is that the total number of outgroup associations is the same for two groups, so that the mean number depends only on the denominator, which is the group's size (46). When applied to conflict, "Members of a minority experience dyadic conflict with the majority group more frequently than members of the majority do with that minority" (Blau, 115). Although this is a deterministic proposition, the probability theorem implied is that when different groups are compared, their size and outgroup victimization rates are inversely related.[4] A further inference is that the relative size of the same group in different communities is inversely related to extent of outgroup victimization.[5] Prior studies of interracial crime (e.g., LaFree's review) have not taken into account structural constraints imposed by variations in group size. Hence, the group size theorem has not been examined across community contexts but has been limited to a static comparison of two groups.

As noted above, a crucial assumption of Blau's theory is that ingroup relations exceed chance expectations. If there were no tendencies toward ingroup victimization, the comparative size of groups and community heterogeneity would necessarily govern rates of intergroup victimization. However, a body of research suggests that victimization is an ingroup phenomenon that occurs between persons of similar age and race backgrounds. Wolfgang, for example, found that the majority of murders in his Philadelphia sample were intraracial and occurred between non-strangers (e.g., friends, relatives, lovers). Moreover, approximately a quarter of the murders were "victim-precipitated," in which the victim was the first to initiate violent behavior. Robbery, rape, and assault also tend to be intraracial and intra-age group (Hindelang and McDermott; Mulvihill et al.; Pittman and Handy; Reiss). Although these studies did not compare observed to expected rates of ingroup victimization, they do suggest that race and age reflect salient parameters in the U.S. in terms of affecting patterns of contact between victim and offender. Blau's theorem that heterogeneity promotes intergroup relations and thus intergroup conflict implies that structural constraints in heterogeneous areas counteract the ingroup tendencies that appear to underlie the victim–offender relationship. Hence, the first empirical question examined in this study is the extent to which ingroup victimizations exceed chance expectations derived from the distribution of the population. Then, the two theoretical predictions tested are

that interracial and interage group victimization are positively related to neighborhood racial heterogeneity and age heterogeneity, respectively.

Data and Methods

The data base is the National Crime Survey (NCS) national household sample. These data were collected by the U.S. Bureau of Census, in cooperation with the Bureau of Justice Statistics of the U.S. Department of Justice. The NCS is a continuous panel survey in which nationally representative samples of households and persons are interviewed twice per year, at six-month intervals.[6] The annual interview sample has approximately 60,000 households containing about 136,000 individuals. The data used in this study are aggregated for the years 1973 to 1978. This data base represents over 800,000 interviews with household respondents, including a subsample of approximately 28,000 victim interviews.

Each household record in the NCS sample contains information on the age and racial composition of the neighborhood in which the household was sampled. The data set used in this study was formed by combining households with similar values of percent black and percent age 0–17 according to 1970 Census neighborhood statistics.[7] The original goal was to construct 100 categories for each parameter by grouping households on the basis of single values (i.e., 0 percent, 1 percent, 2 percent, etc.). However, the frequency distribution necessitated some collapsing of values. First, the maximum percent age 0–17 of non-institutionalized population in a U.S. neighborhood was 66. Further, the values from 51 to 66 were represented by extremely low population estimates and victimization counts, as were the values from 0 to 13. Therefore, households were grouped on more than one value in the ranges of 0–10, 12–13, and 51–66.[8] The resulting number of neighborhood age categories is 44. For percent black, a different problem arose. While the values from 0–100 percent black were fully represented in the U.S., the majority of *people* lived in white areas. Fully 46 percent of the population lived in neighborhoods with 0 percent blacks. In other words, there is a full range of values for percent black but the distribution is highly skewed. By collapsing values where the population ran thin (mostly > 50 percent black),[9] 74 categories of percent black were obtained.

The fact that the population distribution is skewed for percent black has further implications for analysis by type of crime. There were not enough thefts across categories to allow reliable analysis. Thus, for race the analysis is based on total personal victimizations (i.e., rape, robbery, assault, and personal larceny). In contrast, the more even population distribution across fewer age categories results in enough intergroup victimiza-

tions to permit analysis by type of crime. Consequently, thefts and violent crimes are analyzed separately in relation to age heterogeneity.

The neighborhood characteristic measures are taken from the 1970 Census, while the victimization data are for 1973–78. Therefore, we must assume that 1970 differences among areas in the relative size of groups and in heterogeneity were similar to those of 1973–78. Fortunately, this assumption can be tested. Because of the cost, it was tested for only one parameter. Percent black was chosen as the stricter test on the grounds that it is more likely to change, especially in large cities, than age composition.

The test of stability of measures involved creating a parallel measure of percent black by aggregating data on individuals from the national personal interview sample. The NCS personal interview data, of course, correspond exactly in time with the occurrence of victimizations (1973–78). For the sample of over 800,000, the race of respondent for the years 1973–78 was broken out for each value of percent black. Then a percent black measure was computed for each category and correlated with the 1970 neighborhood characteristic measure of percent black. The resulting Pearsonian correlation was .98 for 74 cases, significant beyond the .001 level. Spearman's rank correlation was .97, also significant at $p < .001$. The data thus strongly corroborate the assumption that 1970 differences in racial composition reflect 1973–78 differences. Nevertheless, to be safe, both Census and NCS constructed measures of percent black are utilized in analysis, and correlations based on them are compared for differences. In all, however, the successful results of the test prompted the decision to use the Census-based neighborhood characteristic measure of percent 0–17 as a reliable measure of age composition. It is unlikely that neighborhoods changed more in age composition than race composition, and even if they did the above correlations suggest it wouldn't make much difference.

Two kinds of dependent variables were calculated for every neighborhood context; outgroup victimization rates for particular groups, and intergroup victimization rates for the entire population. All outgroup and intergroup rates are based on the subsample of 28,353 victims, excluding the victimizations for which information on the age, race, or number of offenders is not known.[10] It should be emphasized here that the age and race of offenders in the NCS sample are based on victims' reports. Fortunately, the ability of victims to provide accurate information on offenders has been studied elsewhere (see Hindelang, b). Suffice it to say that the evidence supports the assumption that victims can make accurate distinctions among offenders, especially crude distinctions such as race of offenders (i.e., black or white). For the offender age variable, the categories have been collapsed into juvenile ($\leqslant 17$) and adults (18 and older). Therefore, with the dichotomous distinction of black–white and juvenile–adult it is quite unlikely that misclassification of offenders will introduce any significant bias.[11]

One final methodological issue needs to be addressed. It is apparent that a victim may be victimized by one or more than one offender. It is also apparent that intergroup contact can be established regardless of whether there is one or multiple offenders, as long as the offenders are of similar ages and races. For example, there is no difference in terms of Blau's theory if one black victim is robbed by one white offender, two white offenders or even three white offenders. Thus, in the following analysis victimization *incidents* are examined regardless of whether there was a lone or multiple offender(s), with the restriction that offenders be of similar demographic characteristics. Hence, offenders of "mixed" races are excluded from analysis.[12] If one were to analyze lone and multiple offender victimizations separately, there would be too few incidents to permit detailed analysis. Besides, the data suggest there is no reason to separate them. Hindelang (a) analyzed race of victim by race of offender(s) and age of victim by age of offender(s) for both lone and multiple offenders and found no substantial differences in patterns. Therefore, for the purpose of this analysis perceived age and race of offender include both lone and multiple offenders, with the above noted restrictions.

In sum, the data base consists of 44 categories of the age parameter, and 74 for the race parameter. The majority of these categories represent single values of the structural parameter of interest. For example, all sample respondents in the U.S. living in a neighborhood with 10 percent blacks are classified as one observation. What is of interest in the present analysis, and in Blau's theory, is the influence of objective structural characteristics (i.e., group size, heterogeneity) on intergroup conflict, regardless of geographical location.

Variable Construction

The out-victimization rate of a certain group is the proportion of that group whose adversary in the victimization event is not a member of the same group. For example, the out-victimization rate for blacks is the proportion of blacks in the subsample who encountered a white victim or offender. The formula for out-victimization (OV) provided by Blau and translated to victimization is: $OV = 1 - \{2a/(n_o + n_v)\}$, where a is the number of ingroup victimizations, n_o the number of offenders in the group under consideration, and n_v the number of victims in it (Blau et al., 49).

Interracial and interage victimization rates were also computed for each category. These rates are based on the distribution of victimizations among the groups (e.g., black and white) distinguished by a given parameter. For each category a cross-tabulation was generated for both race and age, with the group affiliation of victims in the rows and the same group affiliations of their offenders in the columns. For example, a 2 × 2 table for

race classifies victimizations according to race of offender by race of victim. In all, 74 such tables were generated for the race parameter and 44 for the age parameter. The major diagonal represents ingroup victimization. The rate of intervictimization (*IV*) is the proportion of victimizations that are not in the major diagonal (e.g., black offender–white victim, white offender–black victim).

The two structural variables examined are the relative size of age and race groups, and the degree of heterogeneity in terms of race and age. The measure of relative size is simply the percent of a neighborhood's population who belong to a group. The measure of heterogeneity (see Blau; Gibbs and Martin) is $1 - \sum p_i^2$, where p_i is the fraction of the population in a given group. When squared and summed over groups, it represents heterogeneity, and its complement is homogeneity. One notes that the heterogeneity measure takes into account both the relative size and number of groups in the population. When restricted to dichotomous groups, as in the present analysis, the range of heterogeneity is from .00 to .50.

In principle, heterogeneity is the same as the chance expectation of intervictimization, but empirically the two are not identical, because the heterogeneity measure is based on the total sample, whereas expected intervictimization is based on the subsample of victimization incidents (see Blau et al., 50, for a similar statement regarding intermarriage). In other words, heterogeneity is $(1 - \sum p_i^2)$ whereas expected intervictimization is $(1 - \sum p_v p_o)$, where p_v is the fraction of all victims, and p_o of all offenders, in a group. Blau argues that in testing the ingroup assumption that intergroup rates are less than statistically expected, the expected and observed rates should be based on the same population. Consequently, both expected and observed rates are calculated on the subset of victimizations. In contrast, heterogeneity is measured from the sample of the whole population. This is because the population at risk includes all people—not just victims. As described above, heterogeneity is expected to promote many kinds of intergroup contact, with intergroup victimization being merely one possible, albeit unfortunate result. Moreover, using two different samples for prediction and dependent variables avoids correlated errors (Blau et al., 50).

Although a neighborhood's heterogeneity is inextricably linked to the size distribution of the population among groups, this does not result in the implications of size and heterogeneity for intervictimization being identical. A partial exception is when a neighborhood is dichotomized into two groups, such as black and nonblack. In this case Blau et al. (51) note that if the same group is the minority in every community then heterogeneity is a nonlinear monotonic function of the size of the minority group, and thus heterogeneity and minority size will have the same rank (but different Pearsonian) correlations with intergroup contact. In the present study no one group is the minority in every neighborhood category (e.g.,

blacks are a majority in many percent black categories), and hence the implications of group size and heterogeneity for intergroup victimization are not identical. Nevertheless, the group size and heterogeneity theorems do not furnish completely independent tests of the theory when dichotomies are analyzed. Unfortunately, the dichotomous division of communities into two groups—black and white or juvenile and adult—is a necessity stemming from data limitations. Of all the parameters in Blau's theory, only age, race, and sex[13] of offender are measured in any reliable fashion in current large-scale surveys. Moreover, the rarity of victimization (less than 5 percent of all persons report a victimization) forces the investigator to collapse age and race into dichotomies to ensure reliable rates. Therefore, if Blau's theory is to be at all tested when intergroup conflict is the social association of interest, it must be done by examining a dichotomous division of groups.

Group Size

As mentioned above, the group size and heterogeneity theorems are subject to strictest tests when the assumption that ingroup relations predominate is true. If there were no tendencies toward ingroup victimization, then size and heterogeneity would necessarily dictate the extent of intergroup victimization. Consequently, the first step in analysis is to examine Blau's assumption of ingroup relations, which in the present case is applied to victimization.

The prevalence of ingroup victimization was examined for race and age by computing chi square (χ^2) within each type of area, comparing observed to expected rates with 1 degree of freedom. In addition, observed minus expected *ingroup* victimization rates were computed and listed for each case to test the predicted sign direction. According to Blau's theory, the null hypothesis of independence should be rejected by finding that ingroup relations exceed chance expectations (vs. outgroup). Thus, Blau's assumption is supported if χ^2 is significant and the sign of observed minus expected ingroup victimization is positive.

The results are presented in Table 1. Overall, one notes that ingroup victimizations substantially exceed chance expectations for both race and age. Fully 72 out of 74 observed minus expected intraracial victimizations were positive, and 60 of these 72 had χ^2 values significant at the .05 level or less. Only 2 contexts had negative results (observed intraracial *less* than expected) but neither of the χ^2 for these two were significant ($\chi^2 = .45$ and .47). The paired *t*-test of the mean of the difference in each area between observed and expected intraracial victimization is 13.3, significant at $p < .001$.

The results for age are even more dramatic, perhaps surprisingly so.

Table 1. INTRARACE AND INTRA-AGE GROUP VICTIMIZATION TENDENCIES, NCS NATIONAL DATA, 1973–78 AGGREGATE

Parameter and Type of Crime	Critical Values of χ^2*						Number of Positive Values of Observed Minus Expected Ingroup Victimizations where χ^2 Probability <.05	N	t-value***	Salience†
	Above 10.83	10.83 to 6.64	6.63 to 5.41	5.41 to 3.84	3.84 to 2.71	Below 2.71				
Race Total crimes	39	10	3	6	4	12	60	74	13.3**	.28
Age Theft crimes	28	5	3	3	0	5	39	44	15.7**	.42
Violent crimes	40	1	1	0	2	0	42	44	15.4**	.48

*A critical value of 10.83 is significant at the .001 level, 6.64 at the .01 level, 5.41 at the .02 level, 3.84 at the .05 level, and 2.71 at the .10 level.

**Significant at the .001 level.

***Paired t-test of the mean of the difference between observed and expected ingroup victimization.

†Salience is defined as $1-(O/E)$, where O is observed and E expected inter-victimization. The mean salience shown is $\frac{\Sigma\{1-(O/E)\}}{N}$, where N is the number of categories.

Although prior research prepares us to expect a high degree of intraracial offending, the prevalence of intra-age group offending has not been similarly stressed. However, the data suggest that ingroup age offending is strongly predominate, more so than for race. For both theft and violent crimes, all values of observed minus expected intra-age victimizations are positive. Moreover, 39 out of 44 and 42 out of 44 of these are statistically significant beyond the .05 level for theft crimes and violent crimes, respectively. For violent crimes, 40 out of 44 critical values of χ^2 are significant at $p < .001$. The t-test of the mean of the differences between observed and expected ingroup victimizations is also significant at $p < .001$ for both theft and violent crimes.

As Blau et al. (60) note, the degree of departure of observed from expected rates indicates how salient a parameter is, or in other words, how strongly ingroup pressures discourage outgroup contacts. The measure of parameter salience, as applied to victimization, is one minus the ratio of observed to expected intervictimization for an area, averaged for the total sample. According to Blau's ingroup assumption, all parameters should have a positive salience. This is clearly the case as Table 1 shows. The salience of race is .28, while for age it is .42 for theft crimes and .48 for violent crimes. Thus, the greater salience of age than race foreshadowed by the above analysis of χ^2 values and t-test comparison is borne out by the data. In sum, the results in Table 1 strongly corroborate the ingroup assumption underlying Blau's theory. Having satisfied this crucial assumption, I will now turn to the more direct results of the theoretical predictions.

The group size theorem predicts that when *different* groups are compared, their size and out-victimization rates are inversely related. A further implication is that the relative size of the *same* group in different neighborhood contexts is inversely related to extent of outgroup victimization. Table 2 presents data that bear directly on the second prediction and indirectly on the first. As to the comparison of different groups, there are only 4 represented in Table 2 (blacks, whites, juveniles, adults), and thus the first proposition is not rigorously tested. Nevertheless, the theorem does enjoy some support in the data. The largest groups—adults and whites—tend to have the lowest outgroup victimization rates.

For example, whites comprise .88 of the U.S. population, but in the total NCS sample have an outgroup victimization rate of only .15. Blacks, on the other hand, comprise .12 of the population but have an outgroup victimization rate of .47. Thus, the data support the proposition that when different groups are compared, their size and outgroup rates are inversely related.

Results of the test of the central prediction that proportionate group size and outgroup victimization rates are inversely related across community contexts are shown in column 3, where Spearman's rank order correlations are presented. One notes the strong negative rank correlations

Table 2. RELATIVE SIZE AND OUTGROUP VICTIMIZATION, BY RACE AND AGE, NCS NATIONAL DATA, 1973–78 AGGREGATE*

Parameter and Type of Crime	Size (U.S. Total)	Outgroup Victimization Rate	Spearman Correlation	Weighted Least-squares Correlation
Race (N=74)				
White (total crime)	.88	.15	-.84**(-.87)**	-.95**(-.95)**
Black (total crime)	.12	.47	-.93**(-.90)**	-.96**(-.96)**
Age (N=44)				
Juvenile:	.14			
Theft		.38	-.42***	-.88**
Violent		.35	-.85**	-.74**
Adult:	.86			
Theft		.15	-.66**	-.60**
Violent		.12	-.80**	-.67**

*Number in parentheses for race parameter is correlation based on the group size measure derived from the Bureau of Census neighborhood characteristic data.

**Significant at the .001 level.

***Significant at the .002 level.

between group size and out-victimization. All Spearman correlations are significant beyond the .01 level, and most are quite strong. For race, the rank-order correlations are all greater than .8. For age, one notes an interesting crime-specific finding. The inverse relationship between group size and outgroup victimization across 44 neighborhood categories is considerably stronger for violent crimes than theft crimes. Although the correlations are all statistically significant, those for violent crimes are of a greater magnitude, especially for juveniles. Another indication of support for Blau's theorem derives from the fact that two separate measures of group size were used—one from the 1970 neighborhood characteristic percent black variable, and the other from data on aggregated individuals from the 1973–78 NCS personal interview sample. Thus, although two *independent* measures of the same construct are used, virtually identical results are obtained for race (note correlations in parentheses).

Rank correlations provide a strong test of the direction and monotonicity of theoretical predictions, but according to Blau et al. (53) they sacrifice specificity and power. An alternative is to utilize a statistical technique that adapts the data to the requirements of regression analysis. Because the assumptions of ordinary least squares are not met, the group size theorem is further tested by employing weighted least squares (WLS). The

heteroskedasticity in variances across areas is compensated for by weighting each case by the inverse of the squared estimate of the standard error of outgroup and intergroup victimization rates (see Blau et al., 51; Neter and Wasserman, 135).[14] Because sample size reduces the standard error and increases the reliability of measures, the result of the WLS procedure is to give less weight to categories with low population estimates.

The weighted least-squares correlations of a group's relative size and outgroup victimization rates are shown in column 4 in Table 2. As one observes, the WLS correlations also strongly support the theorem. All correlations in column 4 are significant at $p < .001$. The only real difference from Spearman's rank-order correlation is that the results for theft and violent crimes for age converge somewhat. That is, the negative WLS correlation for violent crimes is slightly reduced, while for theft crimes the juvenile outgroup rate increased from −.42 to −.88. Again, the two separate measures for percent black show identical results. In all, the WLS correlations present unambiguous results that obviate the need for detailed summary. It is clear that a group's size and its outgroup victimization rate are strongly inversely related across neighborhood contexts. The predictions derived from Blau's theorem are thus supported.

Heterogeneity

Table 3 presents the results of a test of the theorem that heterogeneity increases rates of intergroup criminal victimization. Columns 1 and 2 show the average extent of heterogeneity and intergroup victimization for 2 parameters across neighborhood contexts. Recall that heterogeneity measures are only rough indications of chance expectations of intergroup victimization because they are based on the total sample while intervictimization rates are based on the subsample of victimization incidents. Nevertheless, in all comparisons expected rates of intergroup victimization (column 1) exceed actual observed rates (column 2), although the difference is slight for race. These comparisons lend further support to the assumption that ingroup victimizations occur disproportionately often, which was tested in a different fashion in an earlier section.

Results bearing on the heterogeneity theorem are found in columns 3 and 4, where Spearman correlations are presented, respectively. Focusing first on race, one notes a significant ($p < .001$) positive rank correlation between racial heterogeneity and interracial victimization observed across 74 neighborhood contexts. A much more substantial correlation (.58) is found when weighted least squares is employed. Again, the differences between correlations based on two separate measures of heterogeneity are practically nil (note correlations in parentheses). In short, the heterogeneity theorem enjoys direct empirical support in the present data.

Table 3. HETEROGENEITY AND INTERGROUP VICTIMIZATION BY RACE AND AGE, NCS NATIONAL DATA, 1973–78 AGGREGATE*

Parameter and Type of Crime	Mean Hetero- geneity	Mean Intervictim- ization	Spearman Correlation	Weighted Least-squares Correlation
Race (N=74)	.33			
Total crime		.29	.34**(.32)**	.58**(.52)**
Age (N=44)	.39			
Theft		.20	.44**	.43**
Violent		.17	.67**	.60**

*Number in parentheses for race parameter is correlation based on the group size measure derived from the Bureau of Census neighborhood characteristic data.

**Significant at the .001 level.

Turning to age and crime-specific findings, we again see substantial positive correlations between heterogeneity and intergroup conflict. This is especially true for violent crimes between juveniles and adults, where the WLS correlation between age heterogeneity and interage victimization is .60. All correlations for age (and in the whole table) are significant beyond the .001 level. Similar to the group-size findings for age, a crime-specific finding emerges in the data, with intergroup violent victimization showing a substantially higher Spearman rank correlation with heterogeneity than theft victimization. However, the WLS correlations are very similar to the Spearman correlations, thus preserving the large difference in magnitude between the theft and violent based correlations. In contrast, the WLS correlation between group size and out-group victimization (see preceding section) reduced the theft/violent distinction considerably. The congruence of Spearman and WLS correlations in Table 3 lend credence to the notion that the structural constraints of heterogeneity have greater effect on the violent encounters between juveniles and adults than on encounters where theft is the primary ingredient. In any event, the results in Table 3 as a whole point to a strong and positive relationship between heterogeneity and intergroup victimization.

A Further Test

The above analysis provided support for the proposition that heterogeneity increases the probability of conflict between persons of different groups.

Blau et al. (58) note that the theory is most easily tested when the casual re-
lations of people are under consideration. Because most of the personal vic-
timizations analyzed above took place in public places (e.g., in the street,
park, fields, etc.) between strangers, one might argue that Blau's theory
was not rigorously tested. In other words, if most victimizations occur
fleetingly between strangers in public places, then this form of intergroup
contact might be argued to represent a more casual encounter than the
type envisioned by the theory, where ingroup values prevail. Even though
the ingroup victimization assumption was strongly supported in the data,
we still have no assurance that Blau's theory can explain intergroup con-
tacts between nonstrangers that occur in private homes, where ingroup
values are likely to be stronger. Therefore, the purpose of this section is to
further test the theory by examining a rather unique phenomenon—crime
at home.

Hindelang's (a) analysis clearly points to the different nature of
offenses in the public vs. the private domain. First, victimizations occurr-
ing at the victim's home are relatively rare. For the NCS eight cities sample
Hindelang reports that "Personal incidents . . . occurred much more often
in outside public places (street, park, or field) than in any other location. In
fact, for each subcategory of personal incidents shown, the place of occur-
rence was more likely to be such a public place than all other categories
combined" (205). The NCS national sample analyzed in this paper support
the same conclusion. Approximately 80 percent of all victimizations occur-
red in public places, with about half occurring in the street, park, or field.
More importantly, the prior relationship of the offender and victim is as-
sociated with where the incident occurred. Specifically, victimizations in
the home are more likely to take place between nonstrangers than those in
public places (see Hindelang, a). In brief, victimization incidents that occur
within the private domain of the victim are relatively rare (about 1 in 5 of
all incidents) and occur disproportionately often between nonstrangers.
Therefore, by examining at-home victimizations, which are liable to be
more affected by ingroup tendencies and normative constraints than public
incidents between strangers, the theory is subjected to a stricter test.

To test the application of Blau's theory to the phenomenon of crime
at home, a subset of victimizations that occurred at or very near the victim's
home (e.g., inside house or apartment, hall, garage, yard, driveway, etc.)
was selected. This subsample consists of 5,597 victimizations, which repre-
sents about 20 percent of all personal offenses. Because of the much smaller
number of victimizations, it was necessary to combine theft and violent
crimes for the age parameter, and to further collapse categories of percent
black and percent 0–17 to ensure reliable rates of outgroup and intergroup
victimization. Consequently, the number of neighborhood categories was
cut to 36 for both race and age. However, all other features of the analysis
performed in previous sections apply here.

Table 4 presents results of the test of the assumption that ingroup "at or near home" victimizations prevail over outgroup contacts. As was the case with total incidents, intragroup "at or near home" victimizations substantially exceed chance expectations. Thirty out of 36 neighborhood categories show positive observed minus expected intraracial rates where χ^2 is significant at .05. The comparable figure for age is 28. The paired t-test of the mean of the difference between observed and expected intragroup victimization is 8.1 for race and 8.8 for age, both significant at the .01 level. It is interesting to note that race shows a higher positive salience for "at or near home" crime than it did for total crime (.37 vs. .28). The higher salience supports the inference that "at or near home" victimizations are governed by ingroup racial factors more than public-oriented "street crimes." By contrast, the age parameter indicates a somewhat lower positive salience for crime at home. Still, ingroup victimizations clearly exceed chance expectations.

Columns 1 and 2 in Table 5 present the relationship between relative group size and outgroup victimization. One notes a very strong inverse relationship between relative group size and outgroup victimization for both blacks and whites. All Spearman rank-order and weighted least-squares correlations are significant beyond the .001 level. The correlations for juveniles and adults are somewhat smaller but they are all negative and significant at $p < .001$, except for the juvenile Spearman coefficient ($p < .09$). In all, the group size theorem is strongly supported when the criterion of interest is "at or near home" victimizations.

In columns 4 and 5 one notes a strong positive relationship between heterogeneity and intergroup conflict for crimes occurring in the private domain of the victim. For interracial crime Spearman's rank correlation is .64 ($p < .001$), while the WLS correlation is even higher (.81, $p < .001$). For interage group crime the Spearman's and WLS correlations are .52 and .45, respectively. It is interesting that the positive correlation between interracial victimization and racial heterogeneity is stronger for "at or near home" offenses than for total offenses. For example, Spearman's correlation for total offenses is .34 (see Table 3), whereas for "at or near home" offenses it is .64. Similarly, the WLS correlation increases from .58 for total victimizations to .81 when "at or near home" victimizations are considered. Again, virtually no differences between the separately obtained racial heterogeneity measures are exhibited. In sum, heterogeneity not only explains patterns of intergroup contact for total personal crimes, most of which occur between strangers in public places, it also explains interracial and interage group conflict that takes place within the private domain of the victim.

Table 4. INTRAGROUP VICTIMIZATION TENDENCIES FOR CRIMES THAT OCCURRED AT OR NEAR THE VICTIM'S HOME (E.G., GARAGE, PORCH, YARD, INSIDE HOUSE), NCS NATIONAL DATA, 1973–78 AGGREGATE

Parameter	Critical Values of χ^2*						Number of Positive Values of Observed Minus Expected Ingroup Victimizations where χ^2 Probability <.05	N	t-value***	Salience†
	Above 10.83	10.83 to 6.64	6.63 to 5.41	5.41 to 3.84	3.84 to 2.71	Below 2.71				
Race	22	5	1	2	1	5	30	36	8.1**	.37
Age	20	5	1	2	2	6	28	36	8.8**	.32

*A critical value of 10.83 is significant at the .001 level, 6.64 at the .01 level, 5.41 at the .02 level, 3.84 at the .05 level, and 2.71 at the .10 level.

**Significant at the .001 level.

***Paired t-test of the mean of the difference between observed and expected ingroup victimization.

†Salience is defined as $1-(O/E)$, where O is observed and E expected interracial victimization. The mean salience shown is $\Sigma\{1-(O/E)\}/N$, where N is the number of categories.

Table 5. GROUP SIZE, HETEROGENEITY AND INTERGROUP VICTIMIZATION FOR TOTAL PERSONAL CRIMES THAT OCCURRED AT OR NEAR THE VICTIM'S HOME (E.G., GARAGE, PORCH, YARD, INSIDE HOUSE), NCS NATIONAL DATA, 1973–78 AGGREGATE*

Parameter	Group Size Spearman Correlation	Group Size Weighted Least-squares Correlation	Heterogeneity Spearman Correlation	Heterogeneity Weighted Least-squares Correlation
Race (N=36)				
White	-.90**(-.91)**	-.88**(-.88)**		
Black	-.91**(-.91)**	-.87**(-.86)**		
Total			.64**(.62)**	.81**(.79)**
Age (N=36)				
Juvenile	-.28	-.51**		
Adult	-.62**	-.51**		
Total			.52**	.45**

*Number in parentheses is correlation based on the group size measure derived from the Bureau of Census neighborhood characteristic data.

**Significant at the .01 level.

Summary and Conclusions

The primary objective of this paper was to test two major theorems derived from a theory of social structure (Blau). Specifically, I examined how variations in the size of 4 groups (blacks, whites, juveniles, and adults) were related to rates of outgroup victimization and how differences in heterogeneity reflected by these groups were related to rates of intergroup victimization. Before testing the group size and heterogeneity theorems, the data were examined to test the assumption that ingroup victimizations occur disproportionately often. This assumption was satisfied, as both intraracial and intra-age group victimizations exceeded chance expectations. When the theorems regarding group size and heterogeneity were tested, they found broad support in the data. Both the relative size of age and race groups were strongly inversely related to rates of outgroup victimization. Heterogeneity was found to be strongly positively related to rates of intergroup victimization. These findings were maintained when alternative methods (Spearman's rank and WLS) and alternative measures were used.

The theory was subjected to further testing by repeating the analysis on a subset of victimizations that occurred at or near the victim's home. Victimizations that take place in the private context of the victim's home

are more likely to involve interactions between nonstrangers, and hence are more likely to be affected by normative constraints than are incidents occurring in public places between strangers. However, even for the phenomenon of "crime at home," the theory enjoyed empirical support. In fact, racial heterogeneity showed a stronger positive correlation with interracial victimization at home than it did with interracial victimization in public places. In all, the NCS data provided consistent empirical support for the two theorems tested.

In interpreting patterns of intergroup conflict, particularly interracial conflict, criminologists have most often advanced a subcultural thesis. For example, Curtis has outlined a subcultural perspective that directly addresses the issue of interracial crime. He argues that increases in interracial offending can be traced to black politicalization arising from the civil rights movement. He sees many blacks' crimes against whites as symbolic attacks on the white majority.

More recently, LaFree has proposed a theory of interracial rape that rests heavily on Curtis' cultural perspective. LaFree explains the greater frequency of black–white than white–black rape as the consequence of a power struggle arising out of a sexual stratification system controlled by white males. White women are seen as symbols of freedom, self-worth, and power to black men. Both Curtis' and LaFree's hypotheses contain controversial implications about the nature of black–white social relations in the U.S.

An application of Blau's theory to the data analyzed in this paper diminishes the need to invoke such cultural concepts. Blau's group size theorem can account for blacks' higher proportion of interracial rape than whites'. In the present study, two structural constraints (group size and heterogeneity) explain large portions of the variance in outgroup and intergroup victimization across a variety of neighborhood contexts. As Kornhauser has argued, cultural theorists have often failed to analytically distinguish between culture and social structure, thereby thwarting attempts to disentangle the effects of either. Perhaps because elements of social structure such as group size appear deceptively simple they have been treated not as variables, but as constants. This is unfortunate, for as the present study has shown, structural conditions appear to impose constraints that are quite outside the realm of values, motives, and ideals.

Notes

1. For a more detailed yet concise exposition of the portions of Blau's theory examined in this study see Blau et al. (45–8).
2. In terms of an intimate bond such as marriage, Blau (11, 245) seems to suggest that cultural and psychological factors such as ingroup preferences account for the prevalence of ingroup associations. For other forms of association such as casual friendship or conflict, physical distance and legal constraints (e.g., young people are constrained to be in proximity of one

another in school) are plausible explanations of ingroup patterns. However, Blau's theoretical propositions do not depend or rely on any one psychological or even sociological explanation of ingroup associations. Blau's theoretical structure only requires that people do so associate (i.e., ingroup). Theoretical attention focuses on how structural conditions impinge on these given ingroup tendencies.

3. Blau's group size theorem applies specifically to nominal parameters, whereas age is considered to be a graduated parameter. Some liberty is taken in the present analysis by dichotomizing age into two groups—juveniles and adults—and thereby treating age as a nominal parameter. Although age is an inherent continuous variable, it seems fruitful to analyze the intergroup conflict of juveniles and adults. Indeed, critics of Blau's theory (see Bell) have argued that age has more in common with gender (a nominal parameter) as a role definition than it does with other graduated parameters. Furthermore, given the rarity of victimization experiences it is necessary to combine victims and offenders into age groupings to produce reliable rates. In fact, to analyze interage group victimization across many categories a dichotomy is essential. For these reasons, age is treated as a nominal grouping, although the original theory argues it to be otherwise.

4. See Blau et al. for an extended discussion of this theorem and its variants. It is worthwhile to note that the predicted inverse relationship between group size and outgroup contact is not inevitable for every comparison, because it is possible that the rate of intergroup contact between two large groups exceeds the rate of a small group with either (Blau et al., 47).

5. Although group size has a necessary relation to outgroup contact when two groups are compared, it is conceivable that relative group size would explain little of the variation in outgroup victimization when analyzed across areas. For example, whites may be the minority group in several communities and according to the proposition would have higher outgroup rates than blacks *within* each community. However, white outgroup rates may show little or no variation across areas even though there is variation in percent white between communities. In this case the inferred probabilistic theorem would not be supported even though the virtually tautological proposition on which it is based is true.

6. For additional details of the NCS design and collection procedures see Garofalo and Hindelang, Hindelang (b), and U.S. Bureau of Census (a). If in the household survey a victimization is reported in response to screen questions, a separate incident report is triggered which gathers details about the nature of the victimization event. The victim is asked exactly what transpired, which includes such pertinent information as the race and age of the offender. Crimes are classified according to definitions used in Uniform Crime Reports (Webster). This study is concerned with personal crimes of theft (larceny and robbery) and violence (rape, aggravated assault, and simple assault).

7. To preserve confidentiality, neighborhoods defined by the Census Bureau are not identifiable census tracts, but are aggregated enumeration districts or block groups with a population minimum of 4,000. A study of these neighborhoods has indicated that the aggregation procedure utilized by the Census Bureau resulted in neighborhoods being relatively compact, contiguous, and homogeneous areas approximately the size of a census tract (U.S. Bureau of the Census, b). Because neighborhood characteristics were derived from the 1970 Census, all housing units constructed since then (about 9 percent of sample) do not have neighborhood characteristic identifiers, and are thus excluded from analysis.

8. Specifically, values in this range were collapsed into the following categories: 0–6, 7–8, 9–10, 12–13, 51–53, and 54–66. All other cases are single values.

9. For percent black, the following values were collapsed: 47–48, 54–56, 57–58, 59–60, 61–62, 63–64, 65–66, 67–69, 70–72, 73–74, 75–76, 77–78, 79–81, 82–84, 85–86, 87–88, 89–91, 92–93, 94–95, 96–97.

10. These exclusions represent less than 10 percent of all offenses.

11. It is necessary to consider only perceived black and white offenders, as offenders perceived to be of an "other" race are simply too rare to provide reliable rates. Offenders per-

ceived to be "other" represent only 4 percent of all offenders. The NCS follows the Census Bureau convention (in 1970) of classifying persons of Spanish origin as white. It should also be noted that persons of "other" races (e.g., Chinese) constitute only 1 percent of the NCS sample. Therefore, the assumption that all nonblacks are whites in terms of neighborhood racial composition is unlikely to distort the results.

12. This category represents only about 4 percent of all incidents. When offenders were of mixed ages (about 17 percent of incidents), the age group of the oldest was arbitrarily used to prevent loss of additional cases. This oldest age-group rule is taken from the analysis of Hindelang (b).

13. The sex parameter was not pursued in analysis for the following reasons. First, there was no census measure of sex distribution. Second, sex is such a strong correlate of both offending and victimization (e.g., females were reported as offenders in only 10 percent of all crimes) that outgroup and intergroup victimization rates would be extremely unreliable when analyzed across sex categories.

14. The weighting formula for heterogeneity measures is $(n-1)/pq$, where n is the number of victimization events in the subsample, p the fraction ingroup and q the fraction intergroup victimization. For outgroup victimization, n is the average number of victims and offenders in a group of a subsample, p the group's ingroup victimization rate, and q its outgroup rate (see Blau et al., 51).

References

Bell, W. 1978. "How to Spin a Social Theory." *Contemporary Sociology* 7:692–95.

Blau, Peter M. 1977. *Inequality and Heterogeneity*. Free Press.

Blau, P. M., T. Blum, and J. Schwartz. 1982. "Heterogeneity and Intermarriage." *American Sociological Review* 47:45–62.

Catton, W. 1978. "Understanding Social Differentiation." *Contemporary Sociology* 7:695–98.

Curtis, Lynn. 1975. *Violence, Race and Culture*. Heath.

Garofalo, James, and Michael J. Hindelang. 1977. *An Introduction to the National Crime Survey*. Analytic Report SD-VAD-4. National Criminal Justice Information and Statistics Service, Law Enforcement Assistance Administration, U.S. Department of Justice. GPO.

Gibbs, J., and W. Martin. 1962. "Urbanization, Technology, and the Division of Labor." *American Sociological Review* 26:667–77.

Hindelang, Michael J. a:1976. *Criminal Victimization in Eight American Cities*. Ballinger.

———. b:1981. "Variations in Sex-Race-Age-Specific Incidence Rates of Offending." *American Sociological Review* 46:461–74.

Hindelang, Michael J., and M. Joan McDermott. 1981. *Juvenile Criminal Behavior: An Analysis of Rates and Victim Characteristics*. GPO.

Kornhauser, Ruth. 1978. *Social Sources of Delinquency*. University of Chicago Press.

LaFree, G. D. 1982. "Male Power and Female Victimization: Toward a Theory of Interracial Rape." *American Journal of Sociology* 88:311–28.

Mulvihill, Donald, Melvin Tumin, and Lynn Curtis. 1969. *Crimes of Violence, Volume II: A Staff Report Submitted to the National Commission on the Causes and Prevention of Violence*. GPO.

Neter, John, and William Wasserman. 1974. *Applied Linear Statistical Models*. Irwin.

Pittman, D., and W. Handy. 1964. "Patterns in Criminal Aggravated Assault." *Journal of Criminal Law, Criminology and Police Science* 56:488–97.

Reiss, Albert Jr. 1967. *Studies in Crime and Law Enforcement in Major Metropolitan Areas. Volume 1, Section I. Measurement of the Nature and Amount of Crime*. Field Surveys III. President's Commission on Law Enforcement and Administration of Justice. GPO.

Turner, Jonathan H. 1978. "A Theory of Social Structure: An Assessment of Blau's Strategy." *Contemporary Sociology* 7:698–704.

U.S. Bureau of the Census. a:undated. *Survey Documentation: National Crime Survey, National Sample*. GPO.

———. b:undated. Supplement No. 1 to *Public Use Samples of Basic Records* from the 1970 Census: Description and Technical Documentation. Unpublished report.

Webster, William H. 1978. *Crime in the United States, 1977*. GPO.

Wolfgang, Marvin. 1958. *Patterns in Criminal Homicide*. Wiley.