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The Relationship of Juvenile Delinquency
and Adult Crime to the Changing Ecological
Structure of the City

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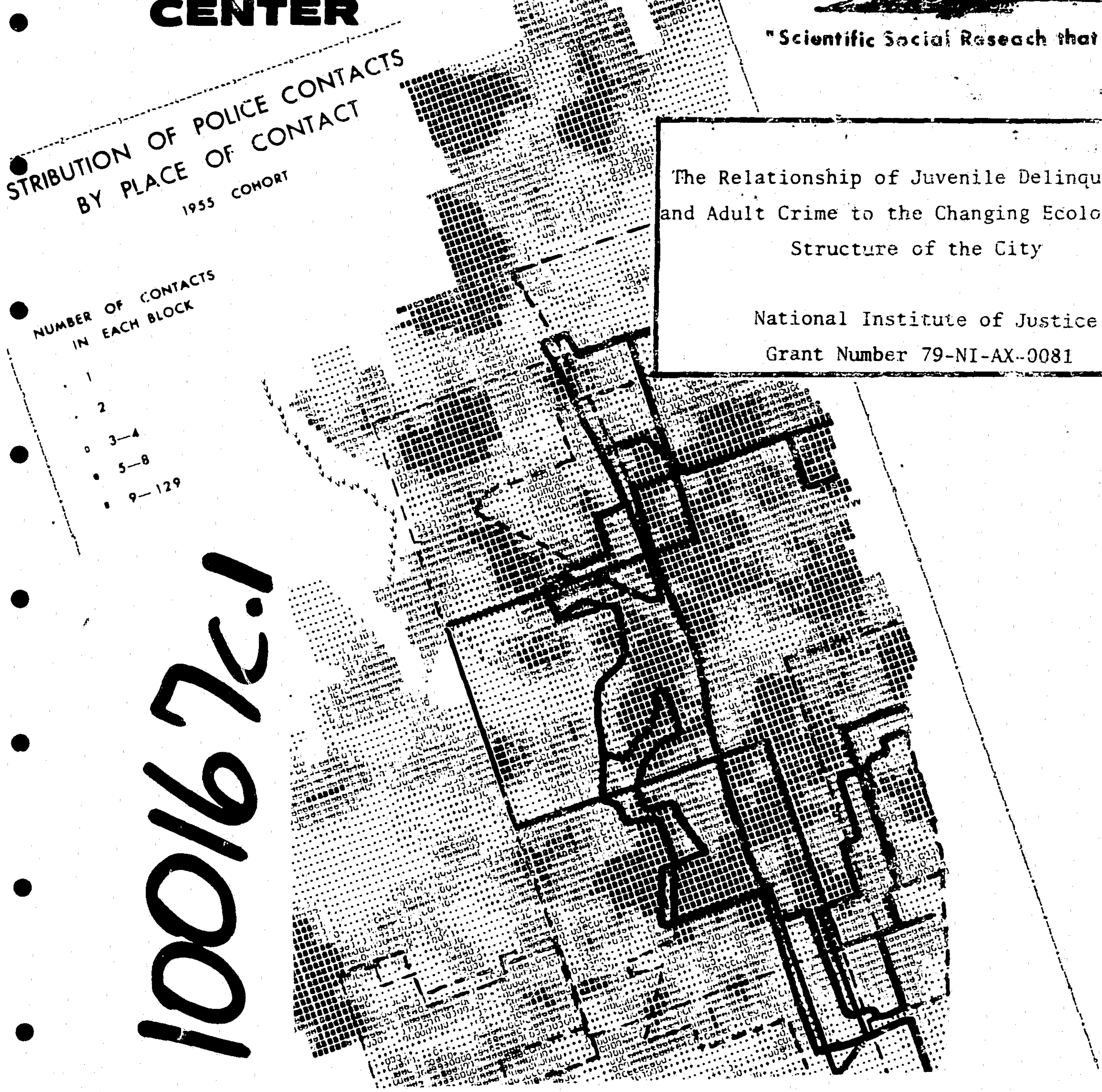

THE UNIVERSITY OF IOWA · IOWA CITY, IOWA

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The Relationship of Juvenile Delinquency and Adult Crime to the Changing Ecological Structure of the City

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PREFACE

This project was originally proposed because, in the course of our work on the Relationship of Adult Criminal Careers to Juvenile Careers (National Institute of Juvenile Justice and Delinquency Prevention, Grants 76JN-99-0008, 76JN-99-1005, 77JN-99-0019, and 79JN-AX-0010) our interest in the hypothesized cyclical nature of change in crime and ecological structure was rekindled by the fact that the spatial distribution of juvenile delinquency and adult crime appeared to be following the changing ecological structure of the city. There was nothing new to this, of course, but it had always seemed that the importance of ecological research in developing a greater understanding of continuities in delinquency and crime had not received appropriate recognition in recent years. That the ecological structure had been developed with block data for another project made it simple for us to code police contacts by place of residence and place of contact and thus produce some intriguing tables on the changing spatial distribution of alleged offenses.

With some preliminary work completed and additional data sets available, we were set to do some work that would have methodological as well as substantive value. The next step was to formulate our scientific concerns in a framework that could also produce answers that would be useful to persons on the firing line. To assume that positive prescriptions for action would be forthcoming might be to expect too much but even if the results contributed only to a better understanding of the processes by which delinquency and crime continue in some areas but not in others or the processes by which new areas of delinquency and crime come into being, that would be an accomplishment.

Should the research quite strongly indicate that what the community is doing in the hope of dealing with a problem is only contributing to the continuation and extension of the problem, that would be a disappointing finding but one which responsible, concerned people must consider. We would conclude that more of the same, e.g., increasing the severity of sanctions and sanctioning even a greater proportion of the miscreants, would not be the solution to the problem.

The numerous and complex findings of this research project are presented here, chapter by chapter, each in a different way adding up to the conclusion that the inner city has hardened and that new areas are developing in which the residents have higher offense rates and in which the rate of offenses committed has increased.

Although the analyses described in this report build on the earlier research and use these data sets as well as others, we cannot help but believe that we have only begun to unlock the vast store of information that we have in the official careers of the three cohorts and the interviews conducted with persons from two of the three cohorts. It is hoped that the reader will share our excitement about the findings described here and our desire to further analyze the data in such a way as to determine the influence of the social milieu on the decision-making process of both youth and adults, considering step-by-step the chain of experiences that cohort members have had in previous years. Thus, we shall be able to combine what we have learned about individual careers and the changing spatial distribution of delinquency and crime with the effects of the social environment on continuities in delinquency and crime.

ACKNOWLEDGMENTS

Several people whose names do not appear on the cover of this report have made important contributions to this research and that which preceded it.

Rachel E. Pezanoski commenced working with us on an earlier project as an interviewer and ended as Field Director. She most recently has supervised data collection for this project in the Police Department and in other Racine offices. The following graduate research assistants have been involved in various stages of the coding and analysis: Vijayan K. Pillai, Tie-Hua Ng, and Shari Hessong Morgan.

Of the many who were involved in secretarial, clerical, and tabular work are Julie Burton, Debi S. Schreiner, and Regina Oni.

The Advisory Board for this project consisted of Roland J. Chilton, Harwin L. Voss, Aubrey Wendling, Marvin Wolfgang, and Robert M. Figlio. The defects that remain are not the responsibility of any of these persons.

The cooperation of Chief James J. Carvino of the Racine Police Department made this project possible, as has that of the chiefs who preceded him, going back to 1960.

Chapter 1. The Complex Nature of the Problem

INTRODUCTION

This book tells us how an understanding of the growth and development of the city will make us less surprised if all of our efforts to deal with delinquency and crime seem to be followed by continuing high offense rates in the inner city as well as newer high rate areas in neighborhoods which have traditionally been expected to have little delinquency and crime.

The importance of ecological research in developing a greater comprehension of juvenile delinquency and adult crime has not received appropriate recognition in recent years. In the course of our longitudinal birth cohort research on the relationship of juvenile delinquency to adult crime it became all too apparent that, while only limited numbers of people had continuous careers in delinquency and crime, there were areas of the community in which law-breaking had become almost a way of life for a disproportionate number of the population and in which an even greater proportion of the population drifted in and out of delinquency more frequently than did the residents of most other areas of the community. Further, it was apparent that delinquency and crime occurred more often in these areas, year in and year out, than in other parts of the community.

The numerous and complex findings of the research to which we then turned are presented here, chapter by chapter, each in a different way adding up to the conclusion that the inner city has hardened at the same time that new areas of delinquency and crime have developed, areas in which the residents have acquired increasingly higher offense rates and in which the rate of offenses committed has increased.

As the chapters in this volume unfold we shall delineate and describe different types of ecological areas, describe changes in the physical and demographic composition of these areas between 1950 and 1980 which are significant enough to alter the ecological structure or pattern of neighborhoods in the city, and the changing spatial distribution of juvenile delinquency and adult crime, and describe the justice system's responses to them.

We are also concerned with the extent to which increasing rates of delinquency and adult crime are followed by population movement, institutional change, and changes in the physical condition of areas which are followed by further increases in delinquency and crime. In short, we propose that the relationship between crime and ecological structure is dynamic and self-perpetuating. Understanding this cyclical relationship requires the analysis of change in ecological structure over time, the distribution of delinquency and crime in the city, and community reaction to changes in both.

It has long been recognized that areas in the community with the physical, institutional, and demographic characteristics (deteriorated and overcrowded housing, abandoned buildings, commercial-industrial establishments, numerous taverns, and a population that has neither been integrated into the economy nor into the broader social structure of the community) which have long marked them as areas productive of delinquency and crime, continue to be productive of delinquency and crime as long as they and their residents are unchanged. These are the areas whose residents are characterized by the lower-class value stretch, i.e., they are aware of the values of the larger society but compromise them from time to time to achieve their immediate wants. Furthermore, as these areas expand or as new areas develop with similar characteristics, the spatial distribution of delinquency and crime changes as well. At the same time, it may be that this combination of physical, institutional, and demographic characteristics and high rates of delinquency and crime generate population movement which further exacerbates the problems of these areas in terms of physical deterioration, institutional change, and the breakdown of social controls. That is, those adults who lend some stability to the area, whether White, Black, or Chicano, move to more desirable areas, taking with them their sometimes miscreant children whose behavior, rather than changing, merely results in enlarged or modified areas which have high rates of delinquency and crime.

In order to understand changing patterns of delinquency and crime we must understand how the social organization and ecological structure of the city change and how areas that once had lower rates of delinquency and crime may now be populated by persons whose ways of life have created a setting in which delinquency and crime are generated and perpetuated.[1] These areas may also have attracted commercial establishments which are targets for those who disvalue law-abiding behavior or may have developed attractions or facilities which transform them into arenas for troublesome behavior by persons who have not been integrated into the larger society.

The social organization of the community refers to the economic base of the community, the types of employment available, the race/ethnic composition of the population, and the distribution of each group within the various sectors of the economy. Changes in the social organization of the community are measured by changes in the proportion of the population employed, the proportion employed in the industrial sector of the economy, and the unemployment rate. Since delinquent and criminal areas persevere and expand (this has been demonstrated in a wide variety of cities and we have found it in Racine as well), the cycle of population movement, residential deterioration, and changing institutional land use continues to generate ever-expanding, new areas whose social and demographic characteristics are productive of high delinquency and crime rates. Unless countermeasures to integrate youth and young adults into the world of work and responsibility are taken, unless steps to reduce population movement, property deterioration, and institutional change that would break the cycle are taken, larger and increasing numbers of areas of the city will become multi-problem areas. Because measures of this nature are not taken or are not of such a magnitude as to be effective, the cycle continues.

The ecological structure of Racine has been developed for the years 1950, 1960, and 1970. Changes in it are measured with block data aggregated into various statistical units or subareas: census tracts, police grid areas, natural areas, and neighborhoods.

Patterns of delinquency and crime are measured by official police data for 1949 through 1979 for the entire city and for three cohorts of persons (born in 1942, 1949, and 1955) on whom more detailed data have been obtained. We are able to compare the findings on delinquency and crime from cohort data with annual data for similar periods obtained from the Racine Police Department's offenses committed and arrest data, in each case transforming the data into comparable ecological and temporal analytic units. In each analysis we concentrate on how change in the demographic, housing, and institutional characteristics of areas is related to change in indices of delinquency and crime. Rather than having only one set of units, we explore the relationship of change in a set of variables to change in another set of variables with each of the four sets of spatial units. By this means we are able to determine if the same or similar results are obtained utilizing various measures of delinquency and crime and different spatial units for the three cohorts vs. annual statistics for different spatial units for the total population.

If the model and empirical findings presented here are accepted, crime prevention and control programs must turn again toward consideration of how the organization of society may be used to prevent the perpetuation of delinquency and crime as a way of life in areas that have traditionally had high rates of police contact, referral, court dispositions, and sanctions.

CRIME AND THE ECONOMY

Before presenting the relationship of delinquency and crime rates to the ecological structure of the city we must briefly examine some temporal changes in crime in the city as a whole and their relationship to Racine's changing economy. In 1949 there were 1.54 Part I Offenses reported to the police per 100 population. This rate fluctuated but steadily rose to a peak of 10.35 Part I Offenses per 100 population in 1975, declined for two years, then increased from the 1977 low to 8.45 Part I Offenses per 100 population in 1979. These trends parallel the Crime Index for the United States presented in the Department of Justice's Uniform Crime Reports, although they are higher than those for the United States as a whole.[2]

In 1960, 5.0% of Racine's labor force was unemployed and in 1978 the unemployment figure was 5.2%. During this 19-year span Racine's unemployment rate fluctuated with low points of 3.6% in 1965 and 1974 and a high point of 7.0% in 1975.[3] While increases in the rate of unemployment were sometimes accompanied by increases in offense rates, the upward trend of offense rates was such that declines in unemployment were just as often as not followed by increases in the offense rate. Since unemployment did not show a long-term trend during the 20-year period under consideration and offense rates steadily rose, neither economic trends nor cyclical explanations of crime rate trends are supported for this span of years. It must be noted, however, that the number of 20-year-olds increased in Wisconsin from 1960 to 1980, thus the number of younger workers in need of jobs increased, the declining birth rate increased the proportion of women able to enter the job market, and fewer people were retiring from work than were entering work. The net result was probably more pressure for jobs than reflected by unemployment rates.[4]

Going a step further, the ratio of manufacturing jobs to people fluctuated within a range from .29 to .36 during the 30-year period from 1950 to 1980.[5] It declined from 1950 through 1959, increased in 1960 but declined again during the 1960s to a point that was slightly lower than the 1959 low, increased again in 1970 but declined until 1974. Since then it steadily increased to its 1979 peak. It might be noted that we estimated that there were 31,628 manufacturing jobs in Racine in 1979 and that the Wisconsin Job Services estimated 31,600 for 1979. Although this ratio suggests decreasing competition in Racine for available jobs, the pressure probably remained about the same because the SMSA is the actual labor force area for Racine manufacturing jobs and its population slightly increased during the 1970s.[6] Again, we conclude that the increase in offenses reported to the police cannot be explained by a simple index of jobs available or by unemployment rates.

The increase in offenses during this 30-year period is a complex phenomenon involving an increasing proportion of youthful members of the community who have neither been integrated into the world of work nor into other institutions in the larger and developing society. The extent to which the increasing heterogeneity of the population is related to the failure of youth to be fully integrated into the larger society will be considered in appropriate chapters as our research is described.

SPATIAL MOBILITY, THE AUTOMOBILE, AND OTHER INSTITUTIONAL CHANGES

When the broader picture of offenses is considered the automobile plays a role, not only in terms of traffic offenses but in terms of ancillary offenses which develop from its varied uses. Between 1941 and 1979 the number of vehicles registered increased three-fold, from 20,100 to 59,938, compared to a population increase from 67,195 in 1940 to 85,541 in 1980.[7] The number of reportable accidents increased from 617 to 3,774, a six-fold increase. The number of persons injured increased from 377 to 1,509 during this period, a four-fold increase. When these were converted into rates per 100 vehicles registered, the reportable accident rate was 3.1 in 1941, increasing somewhat erratically to 5.6 by 1960 and 6.3 by 1979. This period was one in which youth obtained increasing access to the automobile, a phenomenon previously found related to higher rates of police contact, not only for moving vehicle violations but for other offenses as well.

We do not imply that increased availability of the auto is a major factor in the increasing offense rate in Racine but do emphasize that offenders are no longer bound to their own neighborhoods and may roam more freely, finding themselves in a variety of difficulties far from home--just as the person who lives in a quiet neighborhood may find the miscreant at his or her doorstep.

Another measure of the increasing involvement of automobiles in police contacts comes from traffic flow data.[8] Weekday counts showed that the number of automobiles passing peripheral counting points more than doubled and even trebeled on some major arterials between 1956 and 1978. On some extremely congested arterials the flow increased five-fold during that period. During a similar period mass transit passengers declined from 5,042,766 per year to a low of 525,681 in 1972 but rose to 1,541,007 by 1978, a figure still far below that of earlier years.[9] That some routes had twice the proportion of youthful riders as did other routes may explain differences in delinquency and crime patterns not otherwise accounted for.

Changes which may seem to be less prosaic are also bound to have their impact on patterns of delinquency and crime. New schools have been built, others have been closed. Youth who reside in a given area no longer may be sure that they will attend their neighborhood school--for better or worse. New parks, playgrounds, and Neighborhood Centers[10] have been established, as have other recreational facilities which attract youth, some of whom may be well-mannered under most conditions and circumstances but less than docile under others. The number of taverns and restaurants serving alcoholic beverages not only increased but areas previously without such establishments found them in their midst. Thus we see that the community has been growing in ways that are almost certain to generate increasing delinquency and crime quite apart from those patterns which are associated with deterioration and inner city decay. We now turn to a brief summary of the chapters which follow.

AN OVERVIEW OF THE CHAPTERS WHICH FOLLOW

The second chapter describes the ecology of the city and the characteristics of each of the units in the four spatial systems, culminating in the clustering of units within the different systems with emphasis on delineating areas in which rates of delinquency and crime should be relatively high and show continuity over the years and across cohorts. The changing spatial distribution of five ecological variables which will be repeatedly used in the analysis are presented by decades in three-dimensional maps to familiarize the reader with the social typography of the city.

The third chapter examines the data sets which have been utilized in determining delinquency and crime rates and the spatial and temporal differences in rates.

The relationship of the characteristics of areas within census tracts and police grid areas to offense and arrest rates within these spatial systems are described in the fourth chapter.

Although presented for each data set for various periods in time, the analysis is basically cross-sectional rather than dynamic.

Chapter 5 deals with changing relationships between the characteristics of areas and offense and arrest rates with regression analyses of areal characteristics and official crime rates by tracts and grids. The following chapter, Chapter 6, describes the distribution of cohort delinquency and crime, referrals, and sanctions according to each of the spatial systems. As an extension of this chapter, Chapter 7 shows how the cohort data may be used in testing a dynamic model of spatial change in patterns of delinquency and crime. Taken together, these chapters reveal that there is a hardening of the inner city as an arena for delinquency and crime at the same time that more peripheral areas are also developing higher rates of delinquency and youthful crime.

Chapter 8 deals even more extensively with the hardening of the inner city and the consequences of movement to higher or lower SES areas.

Multiple regression analysis is used in Chapter 9 to assess the impact of neighborhood ecological characteristics on the delinquency and crime rates in the three cohorts. Delinquency and crime rates for the 1950s and 1960s are added to the equation, resulting in the conclusion that a combination of ecological characteristics and prior delinquency and crime in neighborhoods explains most of the variance in neighborhood rates for the 1970s.

The last chapter, Chapter 10, is a summation of the findings about changes in the characteristics of areas in the city, responses of officials to delinquency and crime, and the continuities that seem to be generated. It also suggests the meaning of these findings to decision-makers on the firing line.

One final comment must be made in concluding this introductory chapter. This, as was the case for our earlier study,[11] is an examination of social processes in an urban, commercial-industrial area. These processes may be found in other cities whether they are larger metropolitan areas or smaller than Racine. For this reason the Racine and Philadelphia cohort studies have generated remarkably similar findings.[12]

FOOTNOTES

[1] A few of the earliest and most recent relevant studies are cited here: Clifford Shaw, *Delinquency Areas*, Chicago, University of Chicago Press, 1929; Clifford Shaw and Henry D. McKay, *Social Factors in Juvenile Delinquency*, Washington, U.S. Government Printing Office, 1931; Clifford Shaw and Henry D. McKay, *Juvenile Delinquency and Urban Areas*, Chicago, University of Chicago Press, 1942; Walter B. Miller, "Lower Class Culture as a Generating Milieu of Gang Delinquency," *The Journal of Social Issues*, Vol. 14, 1958, pp. 5-19; John P. Clark and Eugene P. Wenninger, "Socio-economic Class and Area as Correlates of Illegal Behavior Among Juveniles," *American Sociological Review*, Vol. 27, December 1972, pp. 826-834; Roland J. Chilton, "Continuity in Delinquency Area Research: A Comparison of Studies for Baltimore, Detroit, and Indianapolis," *American Sociological Review*, Vol. 29, February 1964, pp. 71-83; Robert A. Gordon, "Issues in the Ecological Study of Delinquency," *American Sociological Review*, Vol. 32, December 1967, pp. 927-944; Elliot Liebow, *Tally's Corner*, Boston: Little, Brown & Co., Inc., 1967; John W.C. Johnstone, "Social Class, Social Areas and Delinquency," *Sociology and Social Research*, Vol. 36, October 1978, pp. 49-72. The most recent and undoubtedly the most thorough summary of the literature, statement of the implications of the research that we consider pertinent to our own work, and conclusion as to what must be done if we are to achieve a better understanding of the process by which delinquency is generated

and perpetuated, may be found in Ruth Rosner Kornhauser, *Social Sources of Delinquency*, Chicago: University of Chicago Press, 1978, Chapter 3.

[2] United States Department of Justice, F.B.I. Uniform Crime Reports. *Crime in the United States 1979*, Washington, D.C.: Government Printing Office, 1980. Other selected years were examined to establish trends.

[3] Wisconsin Department of Industry, Labor and Human Relations, Bureau of Research and Statistics, Wisconsin Job Services (made available by Racine Job Service).

[4] Ibid.

[5] *Racine Area Manufacturers Directory 1980*. Racine: Racine Area Chamber of Commerce, 1980. University of Wisconsin-Parkside Survey of Manufacturing Firms in Racine-Kenosha 1870-1972. The Racine Manufacturers Association and Wisconsin Job Services were very helpful in securing all available documents for us.

[6] *U.S. Census of Population and Housing, 1970* and *Census of Population and Housing, 1980*. P.L. 94-171 Counts.

[7] *City of Racine Vehicles Registered*.

[8] *Traffic Maps-City of Racine*. State Highway Commission of Wisconsin in Cooperation with Bureau of Public Roads, U.S. Department of Commerce. 1956 and various years to 1979.

[9] Southeastern Wisconsin Regional Planning Commission. *Racine Area Transit Development Program 1975-1979: Planning Report No. 3*.

[10] Community Services Department and Department of Parks and Recreation, City of Racine, 1977.

[11] Lyle W. Shannon, Assessing the Relationship of Adult Criminal Careers to Juvenile Careers. A final report to the National Institute for Juvenile Justice and Delinquency Prevention, August 1980, 950 pp.

[12] The Racine and Philadelphia studies have been compared in considerable detail in Joan Petersilia, "Criminal Career Research: A Review of Recent Evidence," pp. 321-397, Norval Morris and Michael Tonry (eds.), Crime and Justice, Vol. 2. Chicago: University of Chicago Press, 1980.

Chapter 2. The Ecology of the City

THE LAY OF THE LAND AND THOSE INVISIBLE LINES

Before any analyses can be conducted of the relationship of delinquency and crime to the changing ecological structure of the city, it is necessary to develop ways of measuring ecological (spatial) change.

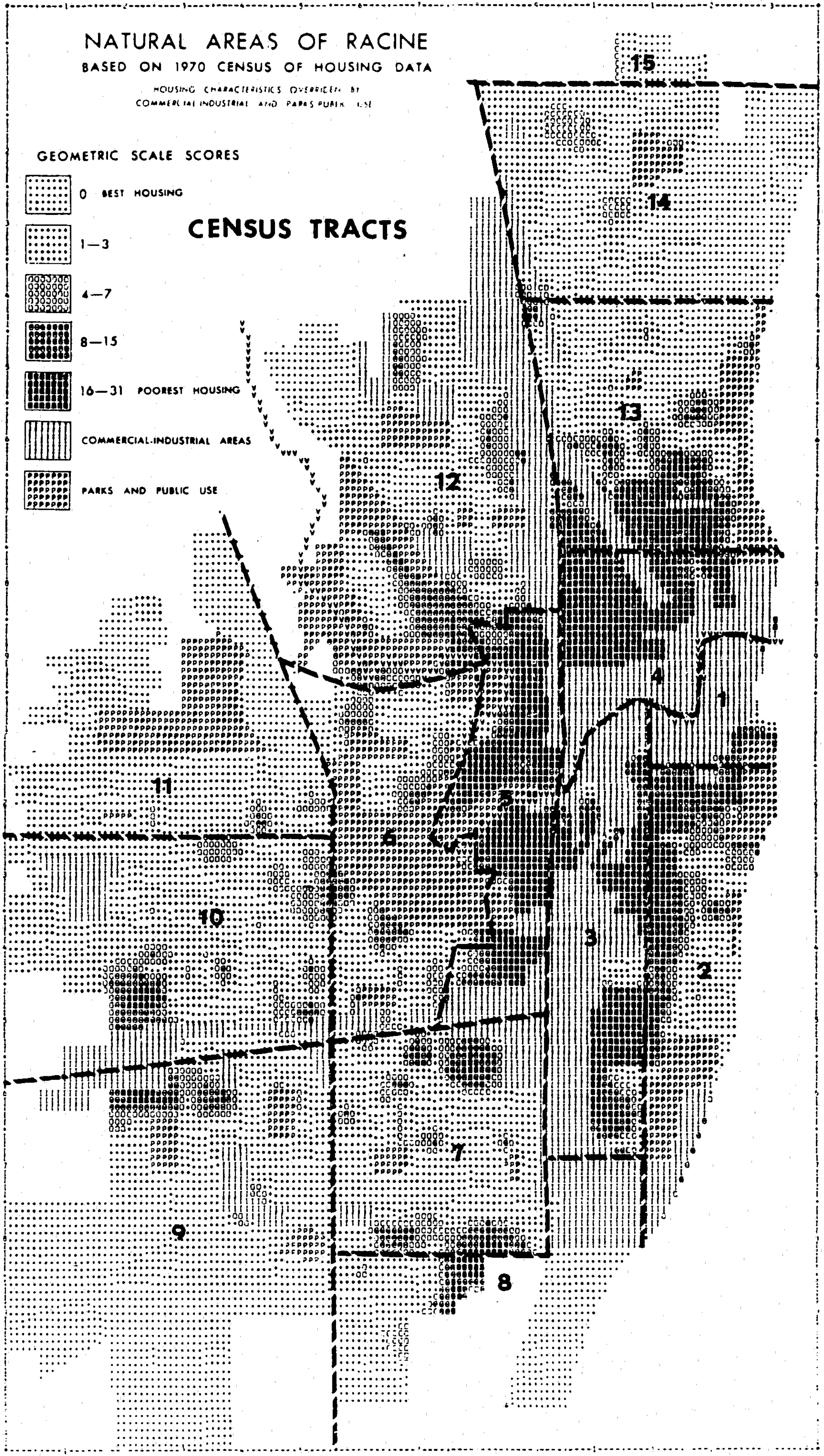
Ecological areas of a city may be described and delineated in a variety of ways, depending upon the spatial units of measurement: blocks, neighborhoods, natural areas, police grid areas, or census tracts, from the smallest to the largest units. Block data from the U.S. Census were utilized in the development of scales (geometric and factor analytic) to represent the quality of housing in Racine, block by block, for 1950, 1960, and 1970 (see Appendix A). In both scales variables available for all three years were utilized: value of owner occupied housing, average contract rent, proportion of units renter occupied, proportion of overcrowding in block, and proportion of units lacking some or all plumbing. These scale scores may also be considered proxies for socioeconomic status and utilized with other variables in characterizing each unit in each of the four spatial systems. Block census data for 1950, 1960, and 1970 and block population data from the 1980 Census made it possible to increase the number of units in each spatial system as the city expanded in area or population from 1950 to 1980 (see Appendix B).

The several maps which follow show each of the four spatial systems. The first map shows the 1970 Census Tracts for Racine superimposed on a computer-generated map of block geometric scores on which commercial-industrial areas and parks and public use areas for 1970 are also shown. The second map shows the Police Grid Areas[1] for which we also aggregated census block data.

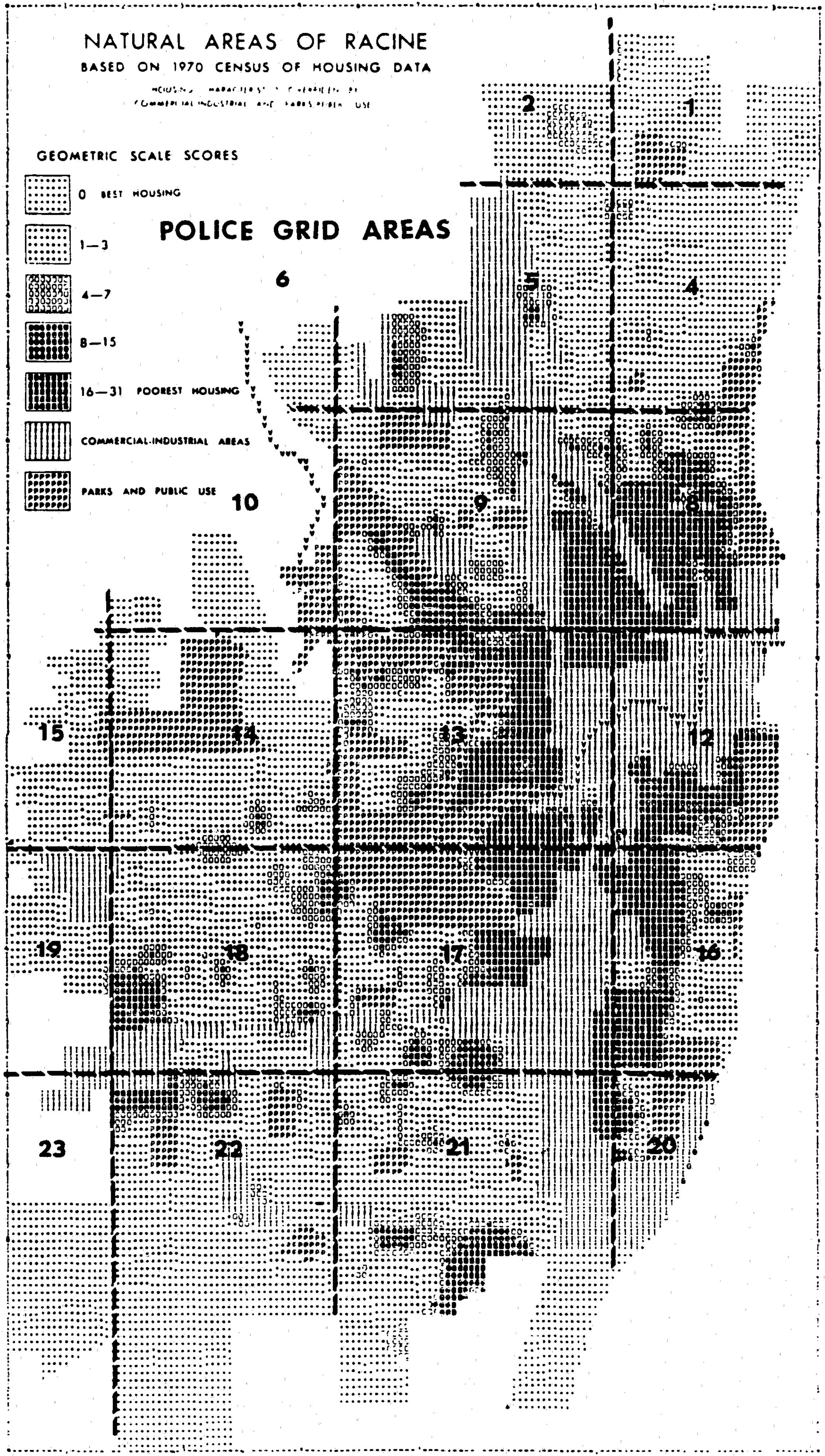
The next three maps present natural areas delineated to maximize the homogeneity of areas on a basis of housing quality scores for blocks.[2] Map 3 for 1970 enables one to see how geometric scores were taken into consideration in the process of delineating natural areas. Map 4 labels each of the natural areas that were delineated and shows how peripheral expansion of commerce and industry has created a transitional area on the edge of the city. Map 5 overlays the 26 natural areas on the housing and land use map, as was done for census tracts and police grid areas.

Numerous efforts were made to generate small, homogeneous neighborhoods with sophisticated computer routines but the small homogeneous areas that we desired were not produced.[3] It is not that the computer failed to delineate homogeneous areas but that it either (depending on the confidence level utilized in the program) marked off similar areas of a geographical shape or size that could not be considered neighborhoods or established a set of relatively smaller areas but excluded so many anomalous blocks that deciding where they belonged would necessitate too many arbitrary decisions.

MAP 1


NATURAL AREAS OF RACINE
BASED ON 1970 CENSUS OF HOUSING DATA
HOUSING CHARACTERISTICS OVERRIDDEN BY
COMMERCIAL INDUSTRIAL AND PARKS PUBLIC USE
GEOMETRIC SCALE SCORES
0 BEST HOUSING
1—3
4—7
8—15
16—31 POOREST HOUSING
COMMERCIAL-INDUSTRIAL AREAS
PARKS AND PUBLIC USE
CENSUS TRACTS
15
14
13
12
4
1
11
5
6
10
3
2
7
9
8

MAP 2


NATURAL AREAS OF RACINE
BASED ON 1970 CENSUS OF HOUSING DATA
GEOMETRIC SCALE SCORES
0 BEST HOUSING
1—3
4—7
8—15
16—31 POOREST HOUSING
COMMERCIAL-INDUSTRIAL AREAS
PARKS AND PUBLIC USE
POLICE GRID AREAS
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2
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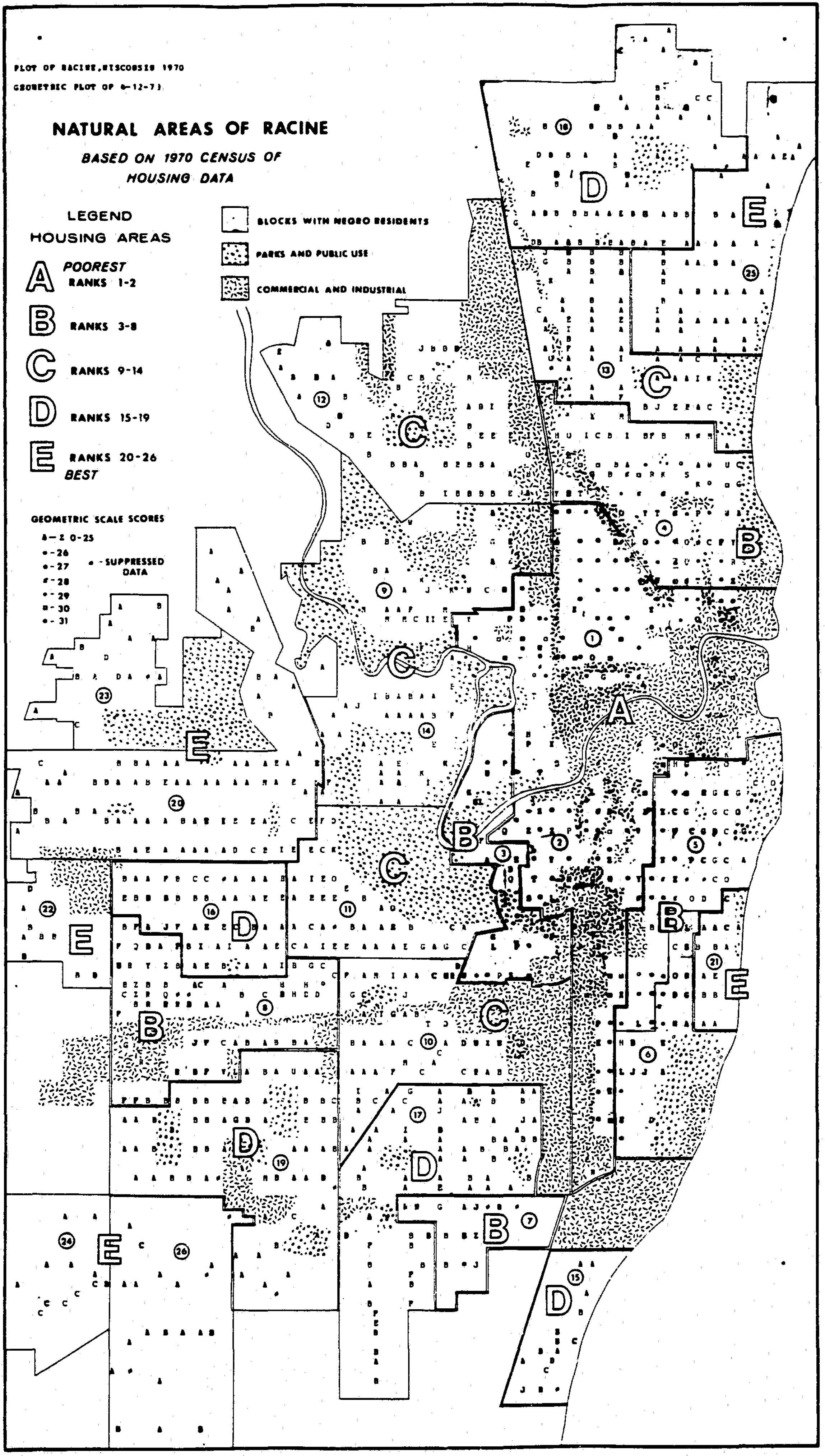
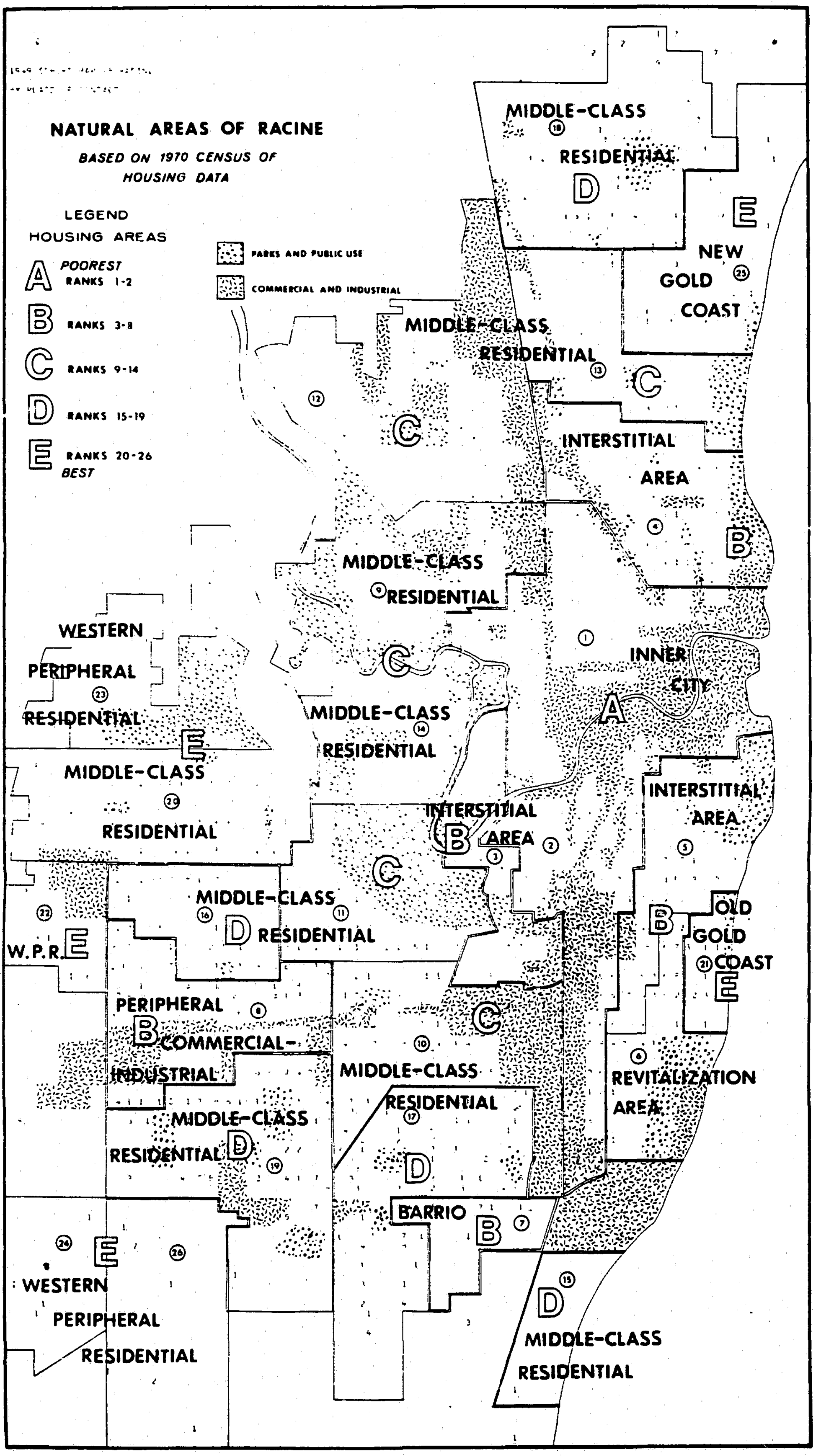
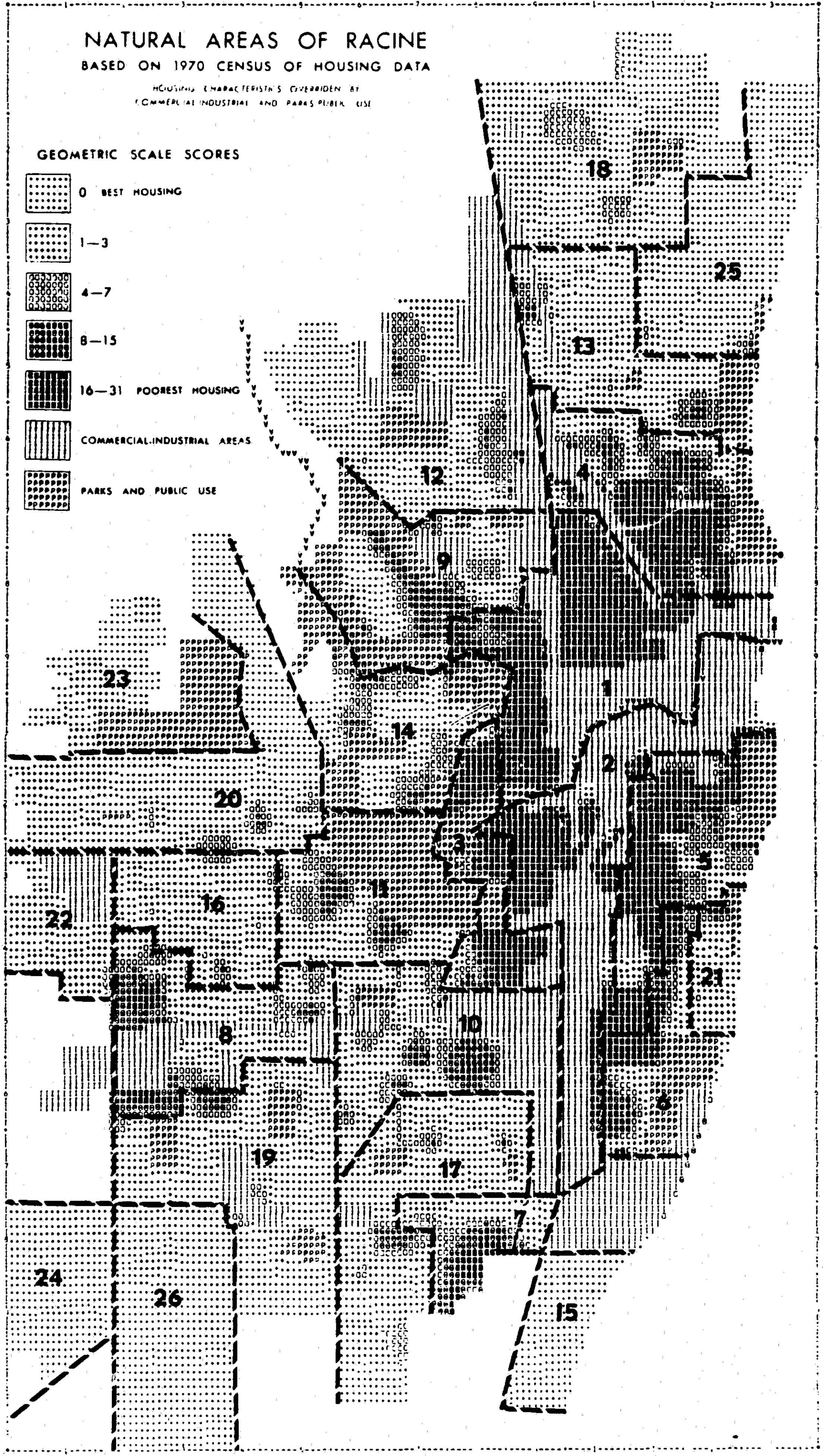
MAP 3


PLOT OF RACINE,WISCONSIN 1970
GEOMETRIC PLOT OF 6-12-73
NATURAL AREAS OF RACINE
BASED ON 1970 CENSUS OF HOUSING DATA
LEGEND
HOUSING AREAS
A POOREST RANKS 1-2
B RANKS 3-8
C RANKS 9-14
D RANKS 15-19
E RANKS 20-26 BEST
BLOCKS WITH NEGRO RESIDENTS
PARKS AND PUBLIC USE
COMMERCIAL AND INDUSTRIAL
GEOMETRIC SCALE SCORES
A—Z 0-25
•-26
•-27
•-28
•-29
•-30
•-31
• - SUPPRESSED DATA

MAP 4


NATURAL AREAS OF RACINE
BASED ON 1970 CENSUS OF HOUSING DATA
LEGEND
HOUSING AREAS
A POOREST RANKS 1-2
B RANKS 3-8
C RANKS 9-14
D RANKS 15-19
E RANKS 20-26 BEST
PARKS AND PUBLIC USE
COMMERCIAL AND INDUSTRIAL
MIDDLE-CLASS RESIDENTIAL ⑱ D
E NEW GOLD COAST ㉕
MIDDLE-CLASS RESIDENTIAL ⑬ C
⑫ C
INTERSTITIAL AREA ④ B
MIDDLE-CLASS RESIDENTIAL ⑨ C
① INNER CITY A
WESTERN PERIPHERAL RESIDENTIAL ㉓ E
MIDDLE-CLASS RESIDENTIAL ⑭
MIDDLE-CLASS RESIDENTIAL ⑳
INTERSTITIAL AREA B ③ ②
INTERSTITIAL AREA ⑤
C
MIDDLE-CLASS ⑯ D RESIDENTIAL ⑪
㉒ W.P.R. E
B OLD GOLD COAST ㉑ E
PERIPHERAL B COMMERCIAL-INDUSTRIAL ⑧
⑩ C MIDDLE-CLASS RESIDENTIAL ⑰ D
⑥ REVITALIZATION AREA
MIDDLE-CLASS RESIDENTIAL D ⑲
BARRIO B ⑦
㉔ E ㉖ WESTERN PERIPHERAL RESIDENTIAL
⑮ D MIDDLE-CLASS RESIDENTIAL

MAP 5


NATURAL AREAS OF RACINE
BASED ON 1970 CENSUS OF HOUSING DATA
HOUSING CHARACTERISTICS OVERRIDEN BY
COMMERCIAL-INDUSTRIAL AND PARKS PUBLIC USE
GEOMETRIC SCALE SCORES
0 BEST HOUSING
1—3
4—7
8—15
16—31 POOREST HOUSING
COMMERCIAL-INDUSTRIAL AREAS
PARKS AND PUBLIC USE
18
25
13
12
4
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1
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Armed with the computer results and summary block scores (housing quality, vacancies, target density, and land use) we set up the 65 neighborhoods shown on Map 6, taking into consideration all natural and man-made boundaries that would discourage or even preclude social interaction. These neighborhoods average 20 blocks in size with each of the 55 predominantly residential neighborhoods (with only a few exceptions) containing from one thousand to two thousand persons in 1970. Areas which are predominantly commercial-industrial or parks and cemeteries (numbers from 60 to 70) are readily distinguishable from those which are primarily residential neighborhoods.

The interrelationship of the four spatial schemes is shown on Table 1, a table which may be referred to from time to time throughout the remainder of the chapter. By now it has probably become clear that smaller units (neighborhoods) do not fit nicely within natural areas, natural areas within police grid areas, and grids within tracts. There are a multitude of problems encountered when one attempts to even align groups of neighborhoods with groups of natural areas but the greatest difficulty comes when attempting to match grids with census tracts. This table shows how complex the overlapping is between tracts and grids and also gives us a glimmer of the difficulty that one has in developing a set of groups which may be described loosely as inner city, interstitial or transitional, stable residential middle and upper SES, and peripheral or outlying upper SES.

MAP 6

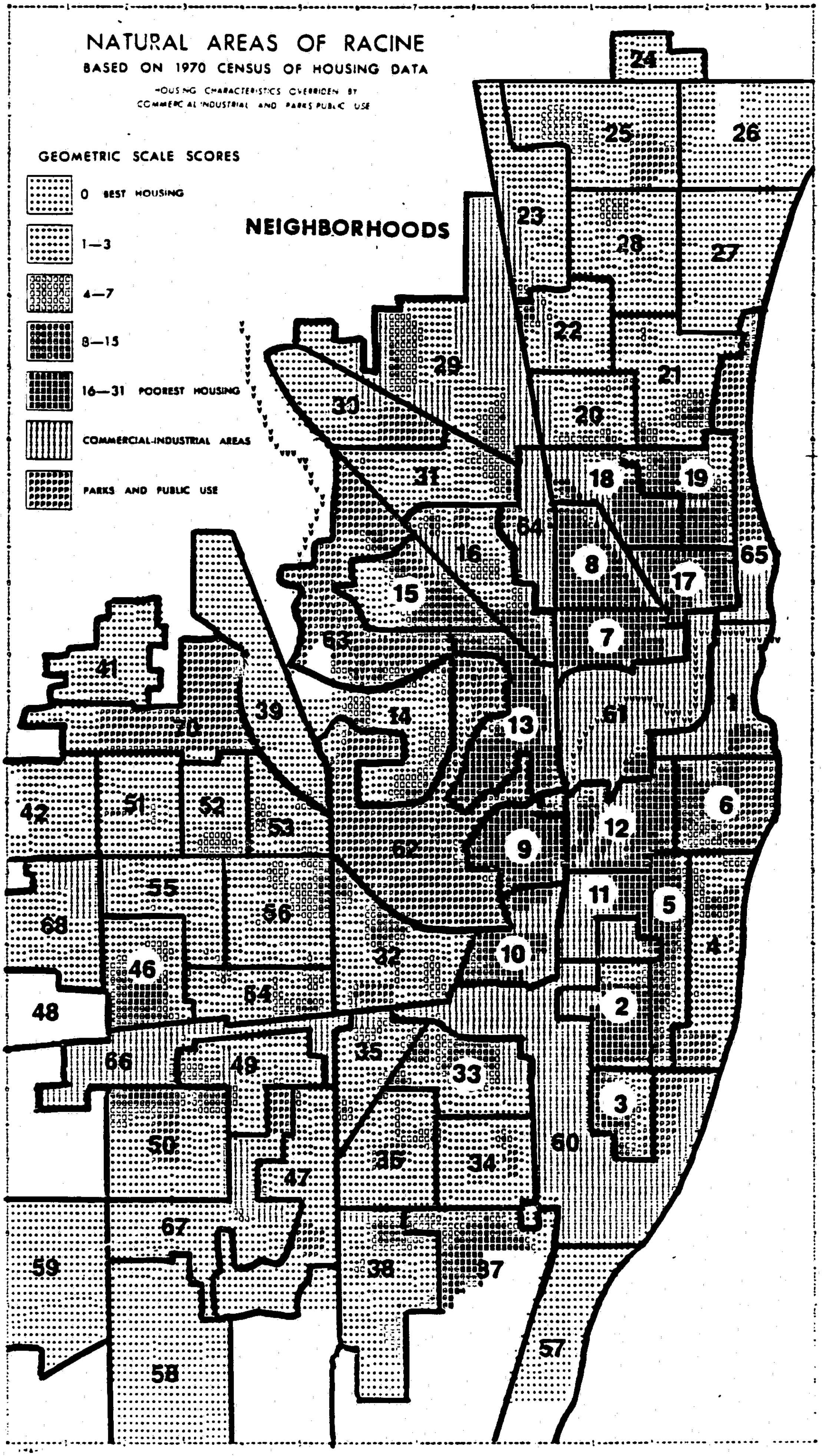
NATURAL AREAS OF RACINE
BASED ON 1970 CENSUS OF HOUSING DATA
HOUSING CHARACTERISTICS OVERRIDEN BY
COMMERCIAL-INDUSTRIAL AND PARKS-PUBLIC USE
GEOMETRIC SCALE SCORES
0 BEST HOUSING
1—3
4—7
8—15
16—31 POOREST HOUSING
COMMERCIAL-INDUSTRIAL AREAS
PARKS AND PUBLIC USE
NEIGHBORHOODS
24
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TABLE 1. RELATIONSHIP OF CENSUS TRACTS TO POLICE GRID AREAS, NATURAL AREAS, AND NEIGHBORHOODS

Relationship of Tracts to Grids		Relationship of Natural Areas to Tracts	Relationship of Neighborhoods to Tracts and Natural Areas
TRACTS	GRIDS	NATURAL AREAS	NEIGHBORHOODS
Inner City			
1	12(T2,3,4)[2]	--	1
3(G12,16)[1]	--	2	2, 3, 11, 12, 60
4(G8,9,12,13)	8(T13)	1	7, 8, 13, 17, 61
5(G9,17)	13(T4,6,12)	3	9, 10
Inner City and Interstitial to Middle SES			
2(G12)	16(T3)	5, 21, 6	4, 5, 6
13(G5,8,9)	4(T14)	13, 4	18, 19, 20, 21, 22, 65
6(G13,14)	17(T3,5,7)	14, 11	32, 62
7(G17)	21(T8)	10, 17, 7	33, 34, 35, 36, 38
Middle to Upper SES and Outlying Areas			
12(G2,10,13)	5(T13,14), 6, 9(T4,5,13)	12, 9	15, 16, 29, 30, 31, 63, 64
10(G14)	18(T9), 19	22, 16, 8	46, 48, 54, 55, 56, 66, 68
9(G18)	22, 23	19, 26, 24	47, 49, 50, 58, 59, 67
8(G21)	20	15, 7	37, 57
Upper SES and Outlying Areas			
11	10(T12), 14(T6,10,13), 15	20, 23	39, 41, 42, 51, 52, 53, 70
14(G4,5)	1(T15), 2(T12)	18, 25	14, 23, 25, 26, 27, 28
15			24

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[1] Grid numbers in parentheses indicate that tract overlapped these grids or that tract overlapped additional grids besides the grid shown in the next column.

[2] Tract numbers in parentheses indicate that grid overlapped these tracts in addition to the tract in the first column.

What becomes apparent is that the heterogeneity of the largest areas in one spatial system may generate scores or characteristics which markedly differentiate them from similar areas with which they overlap in another spatial system. While this is an old problem to ecological research, it is one which must be taken into consideration in assessing what may seem to be dissimilar scores for roughly similar areas.

THE SOCIAL, DEMOGRAPHIC, LAND USE, AND HOUSING CHARACTERISTICS OF UNITS IN EACH SPATIAL SYSTEM

Data were obtained for the four spatial systems on 38 different land use, housing characteristics, and population characteristic variables, some for the units in each spatial system but others only for census tracts. Some of the data were available for 1950, 1960, 1970, and 1980 and some were unfortunately available for only 1970. These data were used to place individual spatial units in relatively homogeneous groups of spatial units. Many of the variables were available only for census tracts. Since we wished to conduct parallel analyses based on four different spatial systems, we were limited to the use of block data for housing, land use, target density, racial composition, and some demographic characteristics in the grouping process for areas other than tracts. Although each of the variables will be briefly described as we proceed, reference may be made to detailed tables and discussion in the appendices.

Primary, secondary, and tertiary land uses for all blocks were coded according to eight categories: residential, business-commercial, schools, parks-playgrounds, cemeteries, institutions (hospitals, government offices, courthouses, etc.), manufacturing-industrial, and vacant (see Appendix C). Targets (taverns, restaurants, grocery and liquor stores, and gas stations) were separately counted as they appeared in each block in 1950, 1960, and 1970. Target density, as described in detail in Appendix D, is the average number of total targets per block for any of the four types of areas. Percent residential vacancy was developed from block census data. The housing exterior and interior scale and the housing picture match were taken from interviews conducted in 1971 as part of an earlier study,[4] as were the attitudinal data. A discussion of the latter may be found in Appendix E.

ANOTHER LOOK AT THE MAPS

We have now arrived at the point where a basic decision must be made. How do census tracts, police grid areas, natural areas, and neighborhoods interrelate or overlap to produce a the final inner city? Which areas make up the final set of transitional areas, those which are hypothesized to be changing physically and socially and, as a consequence, experiencing inordinate increases in delinquency and crime? And which areas are the ones which, by their very nature, should harbor relatively few criminals as criminals are perceived by the public (those who by stealth and force cause injury to property and persons)?[5] Depending on the spatial system utilized, four or five relatively homogeneous groupings are produced, as shown in Table 2.

TABLE 2. SUMMARY OF SOCIAL, DEMOGRAPHIC, LAND USE, AND HOUSING CHARACTERISTICS OF CENSUS TRACTS, POLICE GRID AREAS, NATURAL AREAS, AND NEIGHBORHOODS

TRACTS	GRIDS	NATURAL AREAS	NEIGHBORHOODS			
(Table 1)[1] (Table 5)[2]	(Table 2 (Table 6)	(Table 3) (Table 7)	(Table 4) (Table 8)			
Inner City	*Inner City*	*Inner City*	*Inner City*			
1 H	8 HH	1 HH	17 HH	61 HM	9 HM	2 HM
3 HH	12 HH	2 HH	8 HH	1 H-	5 HM	3 HH
4 HH	13 HH	3 HM	7 HH	6 H-	10 HH	
5 HH	16 HM	4 HM	13 HH	12 HM	11 HM	
		5 HM				
Older or Transitional	*Transitional*	*Transitional*	*Interstitial or Transitional*			
2 MM	9 MM	6 HM	19 H-	65 H-	50 LM	37 MH
13 MM	20 MM	7 M-	18 HM	64 H-	54 M-	60 H-
6 MM	17 HM	8 MM	16 HM	46 MM	66 M-	
7 MM			4 M-	49 ML	33 M-	
Peripheral Middle to High SES	*Stable Residential*	*Stable Residential*	*Stable Middle Class Residential*			
10 MM	14 LL	21 M-	20 M-	30 L-	63 L-	32 M-
9 LM	18 ML	13 ML	21 M-	31 LL	53 M-	35 M-
12 MM	21 MM	12 LM	22 M-	14 M-	56 M-	36 L-
8 LM	4 LL	9 M-	23 M-	15 M-	62 M-	34 L-
		14 LL	29 M-			
		11 MM				
		10 ML				
Peripheral High SES	*Peripheral Middle to High SES*	*New and Peripheral Residential*	*Outlying Middle and Upper SES*			
14 LL	19 L-	18 LL	27 L-	67 M-	25 L-	68 M-
11 L1	15 L-	19 LL	28 L-	47 L-	26 L-	48 L-
15 L-	23 LL	16 ML	51 L-	38 LL	39 L-	58 L-
	5 ML	20 LL	52 L-	57 L-	41 L-	59 L-
	22 MM	22 L-	55 ML	24 L-	42 L-	70 M-
	6 M-	15 --				
	Peripheral High SES	*Peripheral High SES*				
	10 L-	25 L1				
	2 L-	17 LL				
	1 LL	23 L-				
		26 L-				
		24 L-				

---

[1] Hypothesized Delinquency and Crime Producing Characteristics from Tables 1-4, Appendix E. H = High, M = Medium, L = Low.

[2] Hypothesized Delinquency and Crime Producing Characteristics from Tables 5-8, Appendix E, for interviews with 651 persons who lived in Racine 1960-1971.

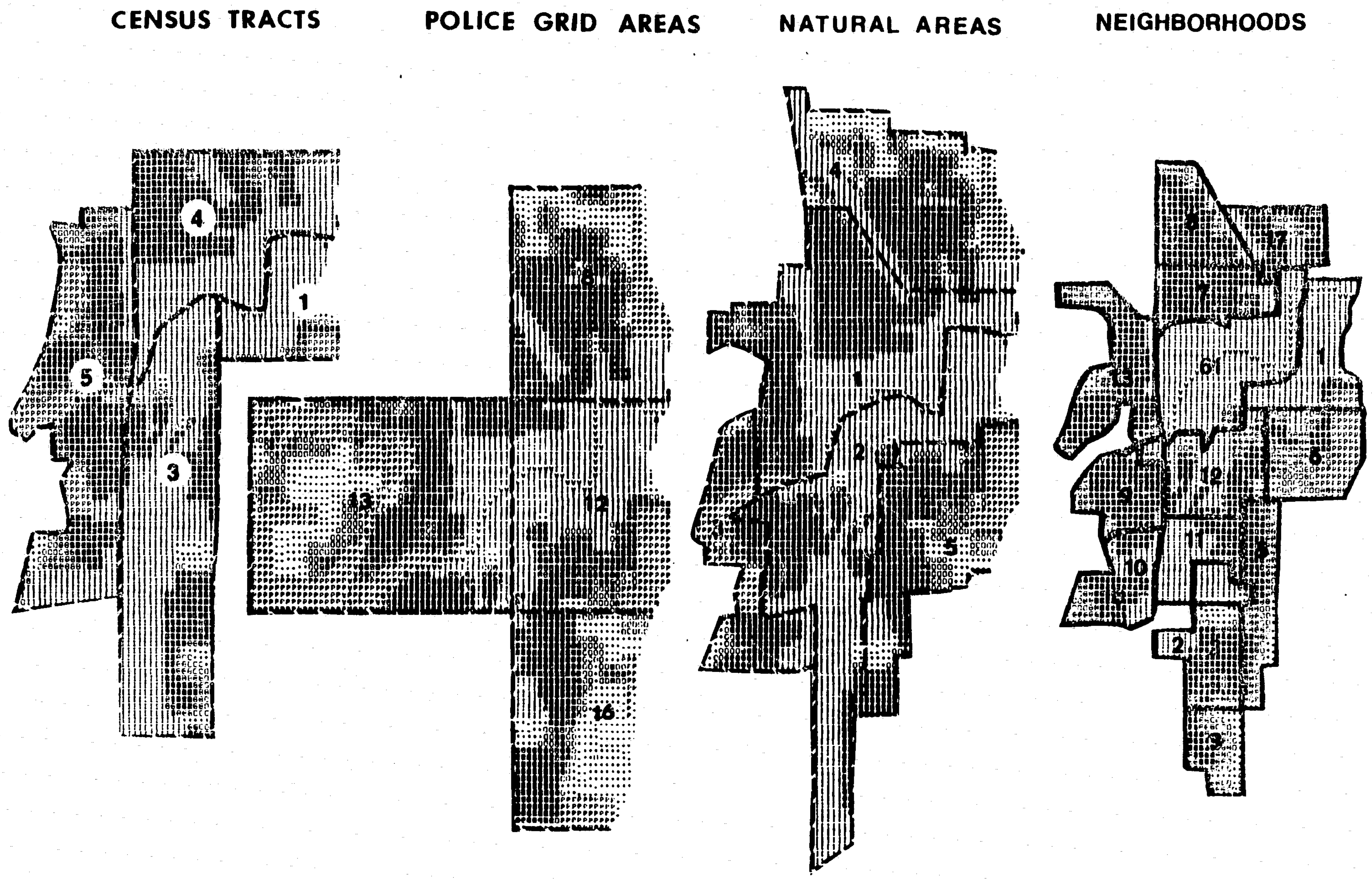
Although considerable time could be spent in describing the various groupings of units within each spatial system, let it suffice to say that the inner city may be delineated with each of the systems presented but that it has a different size and shape depending on the spatial system referred to, as shown on Map 7.[6] Interstitial areas in transition more or less clearly separate the inner city from older and newer stable residential areas which, in turn, are more or less surrounded by developing suburban fringe areas. Make no mistake about it, life in the inner city and interstitial areas has a quality about it that differs from that in other areas. And it must also be remembered that if the beholder is from the middle or upper classes only the physical elements may be seen. Some respond by concluding that it is the environment of the inner city and interstitial areas that generates behavior so little appreciated by those whom it appears to threaten (directly or indirectly through increased costs--increased surveillance at the community level and institutionalization of the delinquent and criminal in the end) while others perceive residents of the inner city as a different breed--people whose values and behavior produce flight to other areas where associations will be more pleasant and property will be safer.

A THREE-DIMENSIONAL VIEW OF THE CITY

Now that the reader has some familiarity with the four spatial systems that will be utilized, we shall utilize a series of three-dimensional maps to present a more dynamic picture of

MAP 7

INNER CITY AREAS OF FOUR SPATIAL SYSTEMS



CENSUS TRACTS

POLICE GRID AREAS

NATURAL AREAS

NEIGHBORHOODS

the ecology of Racine, one which reveals how the characteristics of areas are changing from decade to decade. Since the neighborhood data provide more data points and thus a more detailed map, they will be used in these maps. The five variables which have been selected are those on which major emphasis is placed in the ecological analyses in the chapters which follow. These data are also included in tabular form in the various appendices.

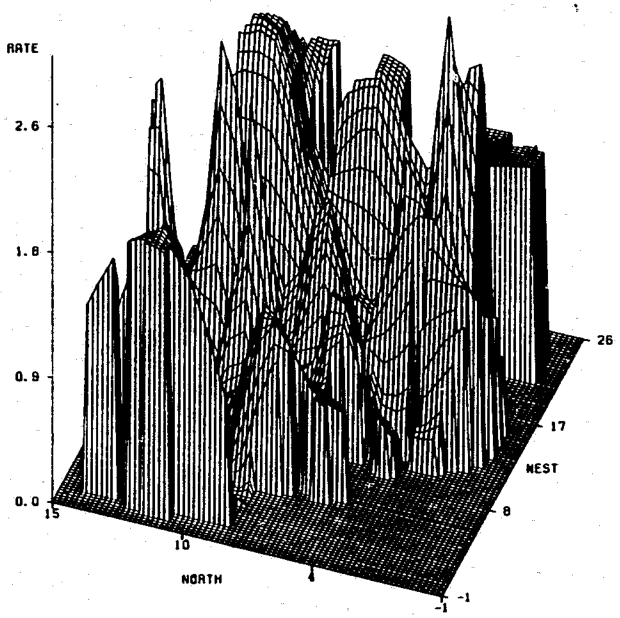
Land Use

The land use score is a summary measure of the neighborhood's characteristics in terms of residential vs. manufacturing land use. The higher the peaks on a map, the lower the residential use of blocks in the neighborhood (see Appendix C). The computer routine that produced these and other three-dimensional maps makes the neighborhood with the highest score highest on the map without regard for the scores of other decades so that the rates shown must be taken into consideration in comparing decades. Since it is the three-dimensional shape of the city in which we are interested, this does not constitute a major problem. Another problem that should be mentioned is that of the base dimensions of the city. The true scale in units shown on the North and West sides of the city should enable the viewer to see that the three-dimensional map has been foreshortened. Racine is longer than wide, as shown on Maps 1 through 6. Maps 8, 9, and 10 reveal that as the city has expanded and lost many of its inner city and interstitial dwelling units to non-residential

MAP 8

MEAN LAND USE SCORE

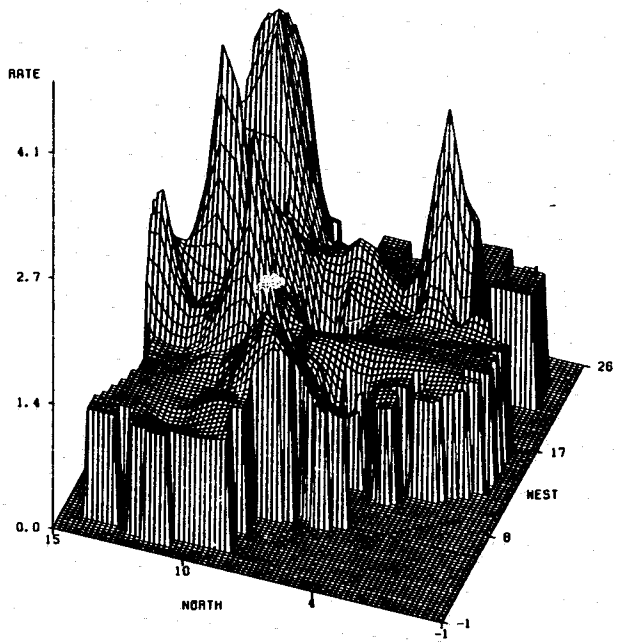
BY NEIGHBORHOOD: 1950



MAP 9

MEAN LAND USE SCORE

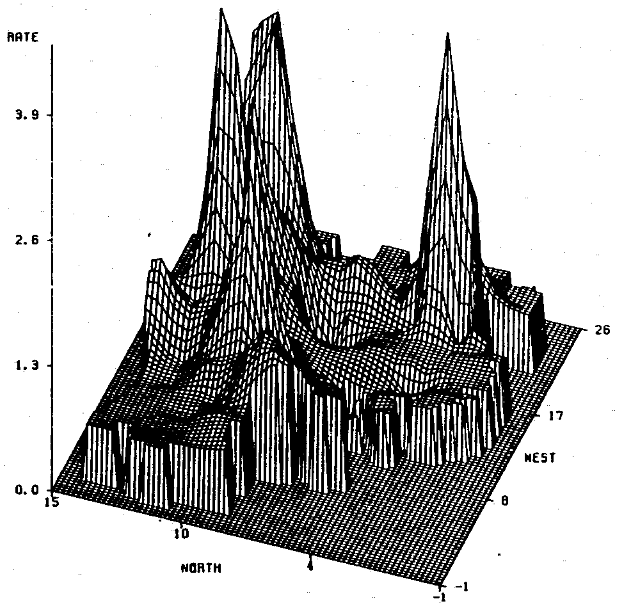
BY NEIGHBORHOOD: 1960



MAP 10

MEAN LAND USE SCORE

BY NEIGHBORHOOD: 1970



use, the contrast between the inner city and outlying areas has increased.[7] The contrast has also been heightened as neighborhoods on the periphery of the city, some of which contained light industry and a few dwelling units in 1950, have filled out as predominantly residential areas by 1970. Development of industry on the southwestern periphery of the city is clearly seen as one moves from Map 8 to Map 10. This suggests that we shall find rates of delinquency and crime increasing disproportionately in these peripheral neighborhoods to other peripheral neighborhoods.

Housing Quality

Standard deviations from the means of the housing quality factor score are utilized in Maps 11, 12, and 13 (see Appendix A). The higher the peaks in this series of maps, the greater the deviation of the housing quality of a neighborhood in the direction of poor housing quality. Note that the inner city and transitional areas are becoming more pronounced from decade to decade, as are several peripheral areas in which housing quality has shown a relative decline compared to that found in most peripheral areas.

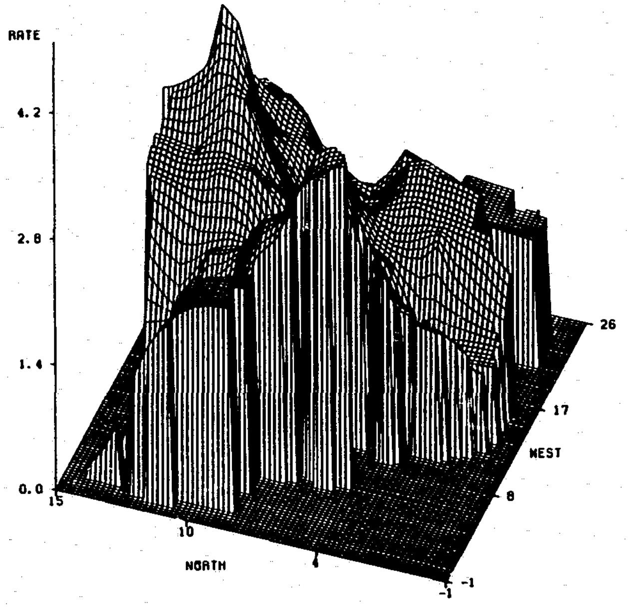
Residential Vacancies

Residential vacancies are represented in Maps 14, 15, and 16 by the mean of the blocks in each neighborhood. Vacancies in the inner city and interstitial areas represent a different phenomenon from those in other neighborhoods. As the analysis progresses we shall see how this changing pattern, which differs

MAP 11

MEAN HOUSING QUALITY

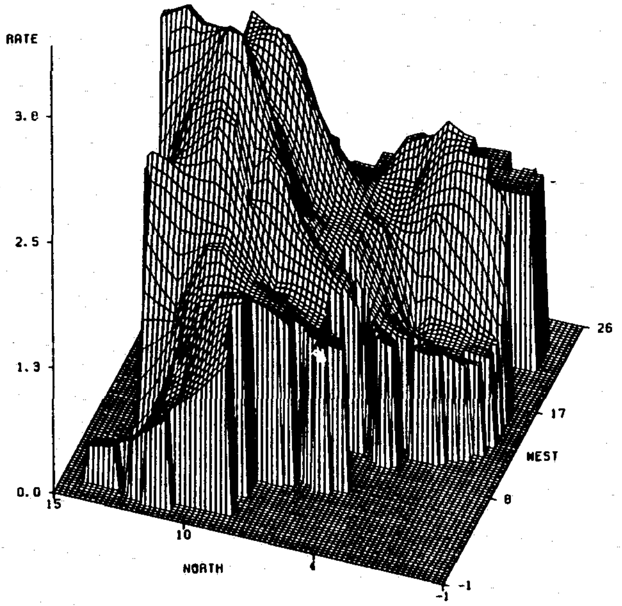
BY NEIGHBORHOOD: 1950



MAP 12

MEAN HOUSING QUALITY

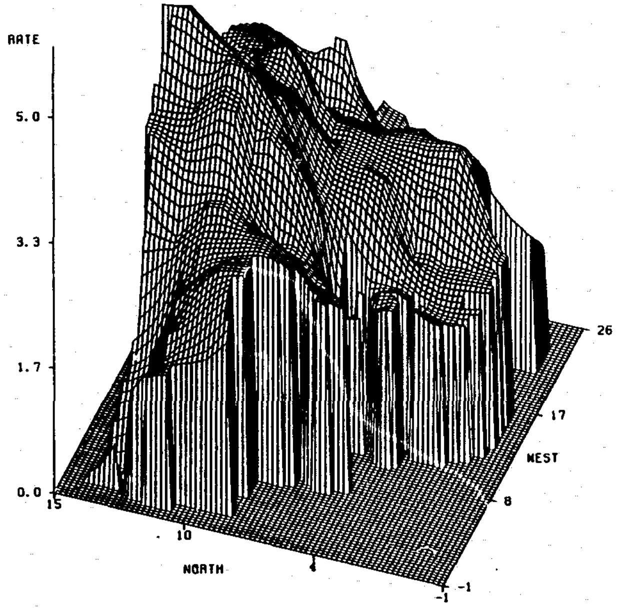
BY NEIGHBORHOOD: 1960



MAP 13

MEAN HOUSING QUALITY

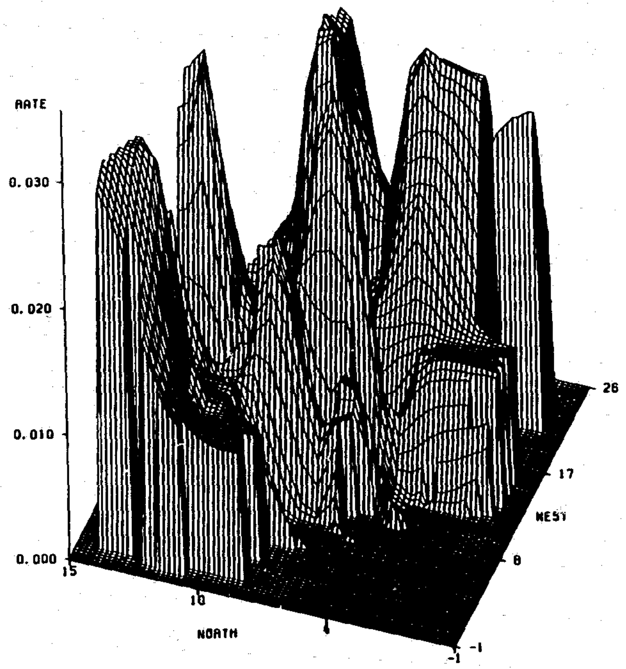
BY NEIGHBORHOOD: 1970



MAP 14

MEAN PERCENT RESIDENTIAL VACANCIES

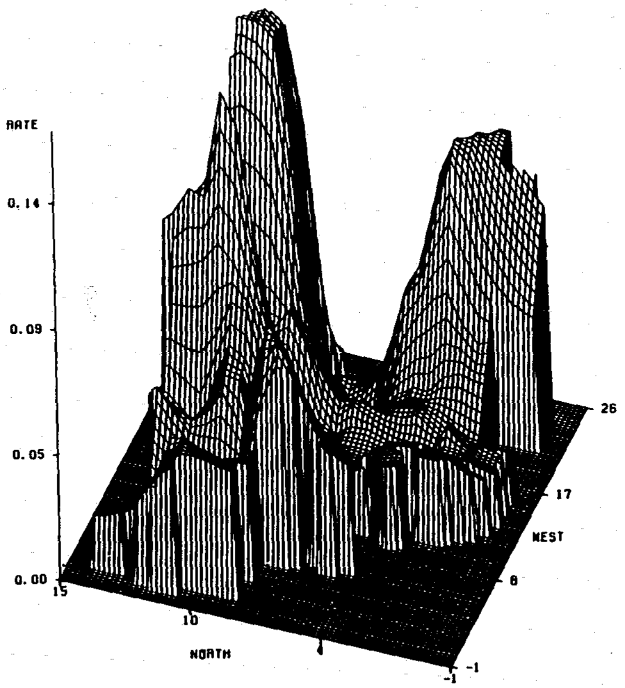
BY NEIGHBORHOOD: 1950



MAP 15

MEAN PERCENT RESIDENTIAL VACANCIES

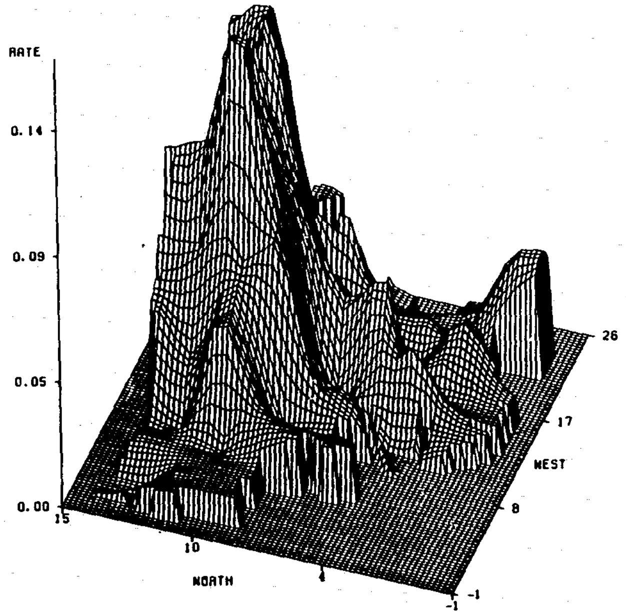
BY NEIGHBORHOOD: 1960



MAP 16

MEAN PERCENT RESIDENTIAL VACANCIES

BY NEIGHBORHOOD: 1970



from that of other variables, has a rather complex relationship to delinquency and crime rates. By the 1970s it was apparent that outward movement made residential vacancies a more distinct characteristic of the inner city and interstitial areas than of other neighborhoods.

Targets

Mean target scores presented in Maps 17, 18, and 19 represent the number of taverns, grocery and liquor stores, restaurants, and gas stations per block. While targets had their highest concentration in the inner city and interstitial areas in 1950, their movement outward by the 1970s was dramatic.

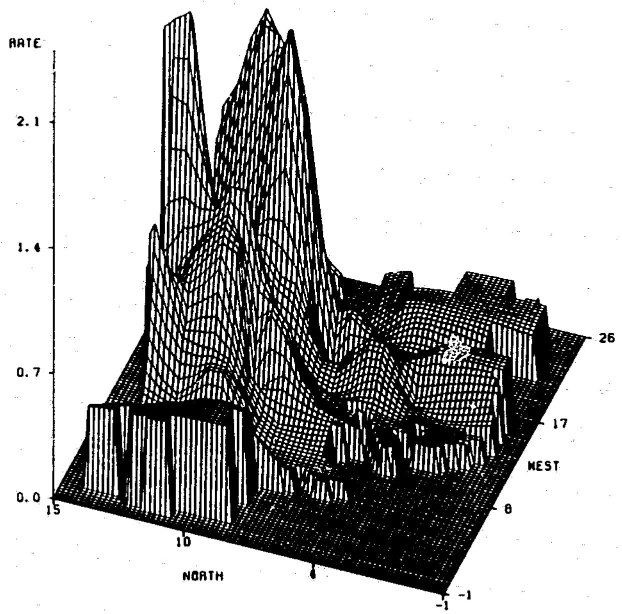
This series of maps should enable the reader to better visualize the structure and growth of Racine. Although Racine is not as large as the great metropolitan areas in the United States, it does present a similar pattern to that of better known cities such as Chicago and Milwaukee whose central business districts and Gold Coasts front on Lake Michigan.

Distribution of the Black Population

Although we in no way consider the racial composition of the neighborhood to be an explanatory variable, so much attention has been focused on race/ethnicity as a variable which must be considered that a series of maps (Maps 20-22) on the proportion of dwelling units occupied by Blacks is included at this point. In 1950 the Blacks made up only 2% of the population but this had increased to 5.3% by 1960 and to 10.5% by 1970. In considering the 1950 map it should be remembered that there is relatively

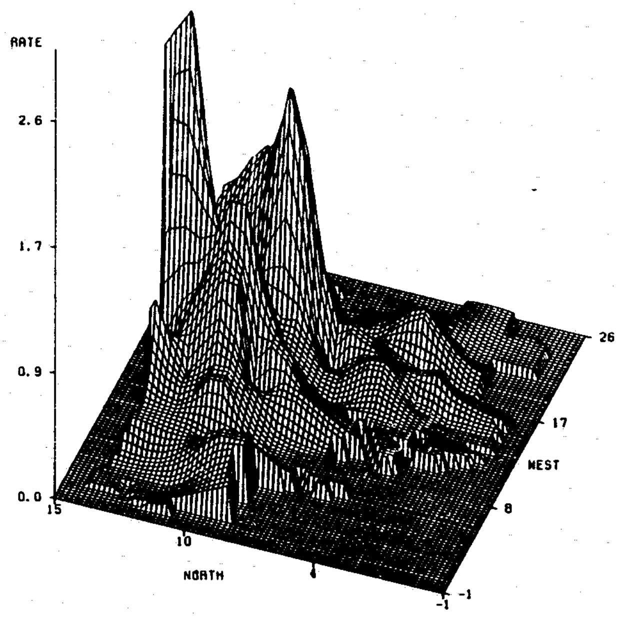
MAP 17

MEAN NUMBER OF TARGETS
BY NEIGHBORHOOD: 1950



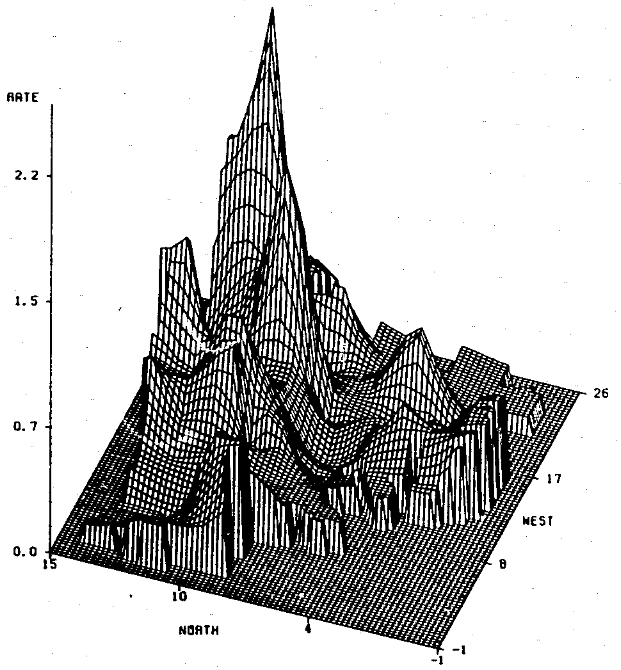
MAP 18

MEAN NUMBER OF TARGETS
BY NEIGHBORHOOD: 1960



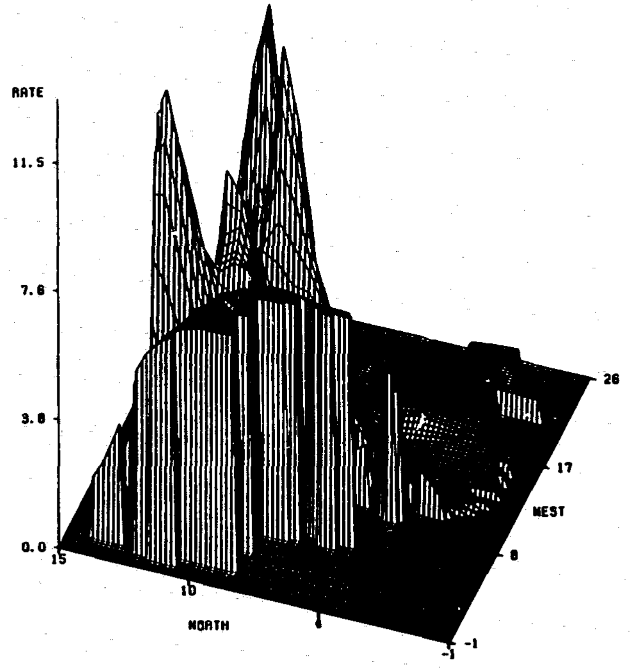
MAP 19

MEAN NUMBER OF TARGETS
BY NEIGHBORHOOD: 1970



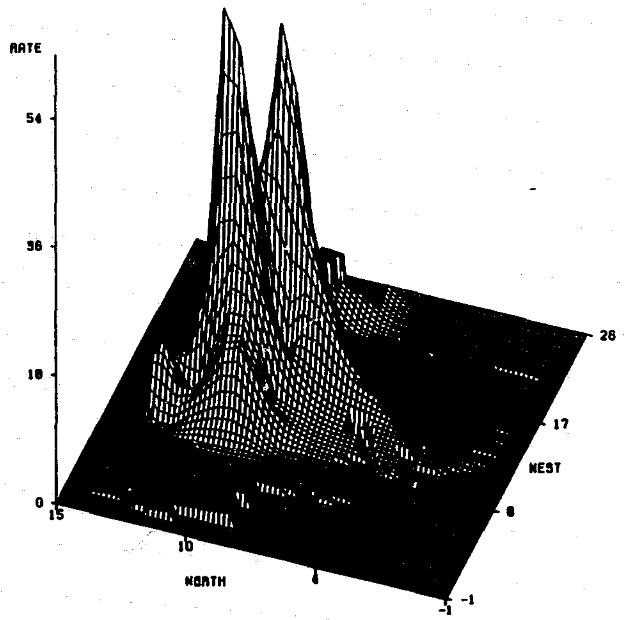
MAP 20

MEAN PERCENT OCCUPIED DWELLING UNITS OCCUPIED BY BLACKS
PER NEIGHBORHOOD--1950



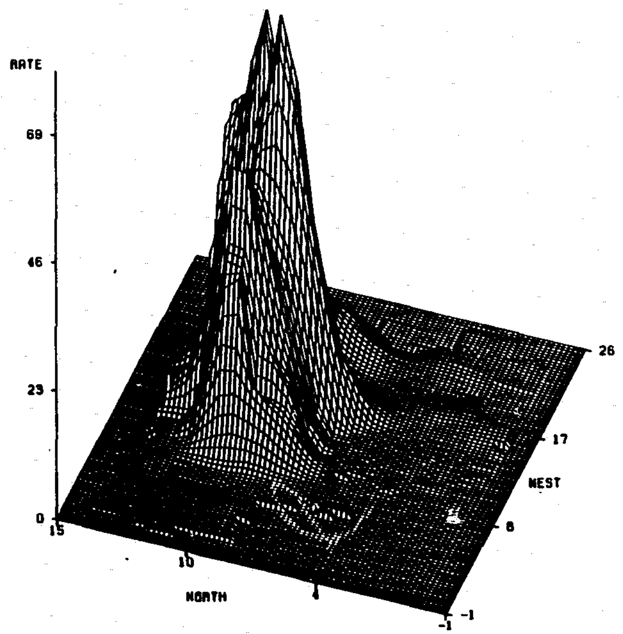
MAP 21

MEAN PERCENT OCCUPIED DWELLING UNITS OCCUPIED BY BLACKS
PER NEIGHBORHOOD--1960



MAP 22

MEAN PERCENT OCCUPIED DWELLING UNITS OCCUPIED BY BLACKS
PER NEIGHBORHOOD--1970



little variation in the proportion of the dwelling units occupied by Blacks from neighborhood to neighborhood. At first glance it may appear that the distribution in 1950 is grossly different from that in 1960 and 1970. This may be attributed to the fact that several neighborhoods on the periphery of the city with relatively small populations had a few more Blacks than were found in most neighborhoods other than those in the inner city. This series of maps shows that an increasing concentration of Blacks in the inner city and interstitial areas was taking place at the same time that a modicum of dispersion was present. How this pattern relates to changing patterns of delinquency and crime and what it means must await the multivariate analyses which will be described in several later chapters.

A WORD OF CAUTION

The characteristics of the census tracts, police grid areas, natural areas, and neighborhoods must be seen as the product of Racine's primarily industrial organization. We, as a consequence, have been able to delineate spatial units whose characteristics are sufficiently different to permit them to be grouped in tables or dramatized in three-dimensional maps. The dynamic aspect of Racine's ecology can be demonstrated with data covering only three decades, best of all when the block data are aggregated into neighborhoods.

The lengthy literature on the ecology of delinquency and crime has provided some contradictory findings on exactly how social and demographic variables are related to delinquency and crime, as have causation studies on delinquency and crime. Although we have looked at numerous ecological variables and shall propose a distribution of delinquency and crime and community reactions to them related to these variables, taking into consideration this lengthy literature, it may be that these hypothesized relationships will not be found or that the findings will be contradictory when the characteristics of areas for different spatial systems are related to their delinquency and crime rates. It is hoped that the reader is not unfamiliar with this sometimes perplexing phenomenon.

FOOTNOTES

[1] Police Grid Areas were established by the Records Division of the Racine Police Department to facilitate the reporting of changing patterns of offenses known to the police in Racine. Whether they delineate homogeneous areas or not is irrelevant, for they serve the purpose intended. The Records Division was able to report how many Part I Offenses took place within these spaces and thus determine if offense patterns were stable or changing from month to month.

[2] When we first became interested in the ecology of Racine during the 1950s, school attendance centers were utilized because they were considered to be relatively homogeneous areas. From a race/ethnic standpoint most were. It became obvious, however, that some were quite heterogeneous in terms of the socioeconomic status of the residents. Block data were utilized as a basis for dividing and modifying these areas. Their names were retained and an attendance center could become North Johnson and South Johnson, for example. This procedure enabled us to discuss areas of the community with concerned persons in a meaningful way. Later it was decided that, whether geometric or factor analytic scores were used, to achieve greater homogeneity would require even further modification of the manner in which areas were delineated. At that time it was decided to call these areas Natural Areas because they were more or less bounded by natural or man-made barriers or by streets that had meaning to the residents of Racine.

[3] Dr. Leo A. Schuerman of the Social Science Research Institute of the University of Southern California assisted us in this operation and provided a statistical package which enabled us to produce homogeneous areas from the block data. This technique is described in, "Statistical Identification of Spatial Neighborhoods," presented at the Special National Workshop, Research Methodology and Criminal Justice Program Evaluation, Panel on Aggregation, Disaggregation, and Units of Analysis, March 17, 1980.

[4] A Restudy of the Absorption of Inmigrant Workers. This study has been described in: Lyle W. Shannon and Judith L. McKim, "Mexican-American, Negro, and Anglo Improvement in Labor Force Status Between 1960 and 1970 in a Midwestern Community," Social Science Quarterly, July 1974, pp. 91-111; Lyle W. Shannon and Judith L. McKim, "Attitudes Toward Education and the Absorption of Inmigrant Mexican-Americans and Negroes in Racine," Education and Urban Society, June 1974, pp. 333-354; Lyle W. Shannon, "False Assumptions About the Determinants of Mexican-American and Negro Economic Absorption," The Sociological Quarterly, Vol. 16, Winter 1975, pp. 3-15; Lyle W. Shannon, "Some Problems in Measuring Changes in Occupation and Income (1960-1970) Among a Cohort of Mexican-Americans, Negroes and Anglos," Pacific Sociological Review, Vol. 19, January 1976, pp. 3-19; Victoria F. Davison and Lyle W. Shannon, "Changes in the Economic Absorption of Inmigrant Mexican-Americans and Negroes in Racine, Wisconsin Between 1960 and 1971," International Migration

Review, Vol. 11, Summer 1977, pp. 190-214; Judith L. McKim, Victoria F. Davison, and Lyle W. Shannon, "Some Effects of the Community on Cultural Integration," *The Sociological Quarterly*, Vol. 18, Autumn 1977, pp. 518-535; Lyle W. Shannon, "The Changing World View of Minority Migrants in an Urban Setting," *Human Organization*, Vol. 30, Spring 1979, pp. 52-62; Judith L. McKim, Victoria F. Davison, and Lyle W. Shannon, "Becoming 'We' Instead of 'They': The Cultural Integration of Mexican-Americans and Negroes," *Urban Education*, Vol. XIII, Summer 1978, pp. 147-178; Lyle W. Shannon and Magdaline W. Shannon, *Minority Migrants in the Urban Community: Mexican-American and Negro Adjustment in Industrial Society*, Beverly Hills, California: Sage Publications, 1973, 352 pp.

[5] The overlay of census tracts (Map 1) shows that Tracts 1, 3, 4, and 5 are clearly inner city with poor housing and industrial-commercial usage. Tracts 3, 4, and 5 were also distinguished from other tracts by the responses of those who were interviewed in the earlier study. Portions of Tracts 2 and 13 are much the same as the inner city areas and should be considered transitional. Tracts 6 and 7 are considered transitional but only a portion of each is properly so. Tracts 14, 15, and 11 are at the other end of the continuum and, as one can see, have no areas of poor housing. The remaining tracts, 8, 9, 10, and 12, have some areas of poor housing and are somewhat heterogeneous in other respects but are best placed in the peripheral middle to high SES group.

The overlay for police grid areas (Map 2) indicates that Grids 8, 12, 13, and 16 may be characterized in much the same way as the inner city census tracts. Since they were not laid out with any intent to achieve homogeneity, transitional Grid Areas 9 and 17 (as do several other grids) include a somewhat larger spatial area than is desirable for research purposes. The fact that crimes in Racine are reported in the press monthly on this basis and that inner city Grids 12 and 13 include such a large proportion of the Part I Offenses known to the police is an argument for conducting an analysis within this spatial system. Although Grid Area 16 is somewhat different from others in its group in terms of respondents' answers during the interviews, it contains the old "Gold Coast" and is thus a more heterogeneous area than 8, 12, and 13. Grid Areas 9 and 17 contain elements of the classical transition in land use. Area 20, although included as a transitional area, is really quite different, demographically and socially, and in some respects is more like the inner city than the other transition areas.

These areas are bordered by more stable residential areas, Grids 4, 14, 18, and 21. Beyond these are Grid Areas 5, 6, 15, 19, 22, and 23, peripheral residential areas of varying socioeconomic status. At the extreme end of the continuum are Grid Areas 10, 1, and 2.

Map 5 overlays natural areas in the city and clearly shows that Areas 1 and 2 constitute the inner city. Although Areas 3, 4, and 5 had been thought of as transitional, it was decided that they too should be included as part of the inner city. This leaves Areas 6, 7, and 8 as transitional, 8 being a somewhat heterogeneous area which overlapped Census Tracts 9 and 10, neither of which were transitional, although those blocks in them which were in Natural Area 8 had the characteristics which resulted in it being considered transitional. Natural Area 7 (the barrio) was part of larger areas (Tracts 7 and 8 or Grid 21) which, in their entirety, were not transitional.

Immediately surrounding the inner city and transitional areas are a number of stable residential areas, 9, 10, 11, 12, 13, 14, and 21, the latter a part of the old Gold Coast. Of these, only 13 and 21 are not separated from the inner city and interstitial areas by industrial areas or parks and parkways. We are not surprised, however, that major thoroughfares have brought to each of these areas rates of delinquency and crime which are comparably higher than those expected in fairly stable areas. Beyond them are more peripheral residential areas--Natural Areas 19, 16, 20, and 22 on the southwest, a similar northern area 18, and Area 15 on the south. At the extreme end of the continuum are Natural Areas 17, 24, and 26 on the southwest, 23 on the west, and 25 on the north lake shore. These are the higher SES natural areas and the type of crime which emanates from the inner city and interstitial areas should be almost completely foreign to their residents, although we shall expect some of their residents and homes to be victims. If more emphasis was placed on the classical pattern of expanding circles or segments of circles, a case could be made for excluding Area 6 from the transitional group.

Delineating the inner city and transitional neighborhoods (Map 6) is in some respects a simpler operation. The City of Racine has outlined what it considers to be the inner city for planning purposes and a smaller revitalization area which includes part of this area but extends beyond it. Inner city neighborhoods within the city's designated inner city and revitalization area commence at the top of the area with Neighborhod 17 and continue through 8, 7, 13, 61, 1, 6, 12, 9, 5, 10, 11, 2, and 3. The City of Racine has designated an area roughly similar to that encompassed by our inner city natural areas as an action area. The Southwest Revitalization area is composed of 104 city blocks, mostly within the city's action area. It contains approximately 25% of the larger action area. Several interstitial or transitional neighborhoods are in part or entirely within the area designated by the city as inner city: 19, 18, 16, and 4. We have also included neighborhoods 65, 64, 46, 49, 59, 54, 66, 33, 37, and 60, although six of them, as in the case of Natural Area 8, constitute a separate transitional area. These neighborhoods are adjoined by several groups of neighborhoods making up the more stable residential areas to which we have previously referred: 20, 21, 22, and 23 on the north, 29, 30, and 31 on the northwest, and 14, 15, and 63 a bit below. Neighborhoods 53, 62, 56, and 32 are similar neighborhoods on the western side of the transitional area.

Neighborhoods 35, 36, and 34 complete this group of more or less stable areas. Beyond these neighborhoods are a number of more peripheral middle to upper class neighborhoods: 27, 28, 51, 52, 55, 67, 47, 38, and 57. At the extreme northern periphery of the city are Neighborhoods 24, 25, 26, 70, 39, 41, 42, 68, and 48. The last of this group on the periphery are Neighborhoods 58 and 59. The size of these neighborhoods is such that we shall expect a better match between measures of delinquency and crime and the characteristics of the area than was obtained with other spatial systems composed of more heterogeneous units.

[6] There has been a lengthy literature on the consequences of using one spatial unit rather than another. Los Angeles has about the same number of census tracts as Racine has blocks. Calvin F. Schmid and Earle H. MacCannel, "Basic Problems, Techniques, and Theory of Isopleth Mapping," _Journal of the American Statistical Association_, Vol. 50, March 1955, pp. 220-239, have shown that block data generate a quite different picture of the ecology of the city than did census tract data.

[7] Although the outline of the city remains the same from 1950 through 1970, some neighborhoods had not developed sufficiently for a score on the ecological variables (or were completely outside the area of urban development) in 1950. There were fewer neighborhoods for which scores were not possible in 1960. This in no way changes the images of the city that are here presented.

Chapter 3. Measures of Delinquency and Crime

Which of the available measures of juvenile delinquency and which of the available measures of adult crime would best enable us to capture the relationship of these phenomena and changes in their rates to the changing ecologcial structure of the city? Although several data sets, including the cohort data, were available for use in the construction of measures of delinquency and crime for spatial systems based on census tracts and police grid areas, only the cohort data, official and self-report, could be used with the natural areas and neighborhoods which we had developed. The relationship of spatial systems to measures of delinquency and crime is shown in Table 1.

In order to familiarize the reader with the non-cohort official data sets covering all residents of the city, some data from each are systematically presented in this chapter. While the interview and self-report data sets are described, these data are not presented until later in the volume. As the analysis develops the reader will be able to discern why we have gone beyond the official records for all residents of the community and placed so much emphasis on the more detailed official records of persons in the three cohorts.

OFFENSES COMMITTED WITHIN CENSUS TRACTS

Property offenses had a rate of 5.75 per 100 persons in 1970 for Racine, increased to a high of 8.64 in 1975, and declined to 6.98 in 1978. Offenses against persons had a rate of .89 per 100

TABLE 1. SPATIAL SYSTEMS AND MEASURES OF DELINQUENCY AND CRIME

Census Tracts	Police Grid Areas	Natural Areas	Neighborhoods
Offenses committed within census Part I Offenses by years, 1970-1978)	Place of Offense (breakdown of Part I by months and years, 1968-1979)	↓	↓
Residence of persons arrested for Part I and II Offenses (by sex, race, and juvenile or adult, 1966-1978)	↓	↓	↓

Police Contacts, Referrals, Severity of Sanctions for 1942, 1949, and 1955 Cohorts (by sex, race, and age at contact, commences in 1948 for 1942 Cohort and ends in 1976 for 1955 Cohort), Place of residence and Place of contact coded by block.

Interview data with 889 persons from 1942 and 1949 Cohorts.

Self-report data for persons interviewed from 1942 and 1949 Cohorts.

persons in 1970, increased to 1.41 in 1974, and declined to 1.25 in 1978. This pattern of increase and decline was found for each of the crimes against property and persons with two exceptions, the rates for rape remained at the 1974 level with some fluctuation and the rate for homicide fluctuated because of the small numbers involved. When individual tracts are observed there is, of course, more variation and less stability in rates, particularly for crimes against the person. However, the high point for property offenses came in 1975 for nine of 14 tracts, with two reaching their peak in 1974 and three in 1976. Crimes against the person peaked in 1974 or 1975 for 10 of the 14 tracts, in 1976 for two others, but in 1978 for Tracts 11 and 14, the two tracts with the highest SES. Obviously there is a certain amount of idiosyncratic variation when less frequently occurring offenses are dealt with and there is a more patterned variation when Part I Offenses are considered as a group.

In order to have a better idea of the consistency with which different offense rates varied over time, every offense rate for every year was correlated with every other offense rate for that year. Offenses against the person and against property had a Pearsonian correlation of .907. Within the offense against property category burglary and theft correlated .830, for example. Assault and rape correlated .942 but theft and homicide correlated .306. Nevertheless, since frequently occurring offenses correlated quite well and there was considerable overall relationship between offenses against persons and property, we concluded that the analyses of variation in offenses committed within census tracts should be conducted with total Part I Offense rates.

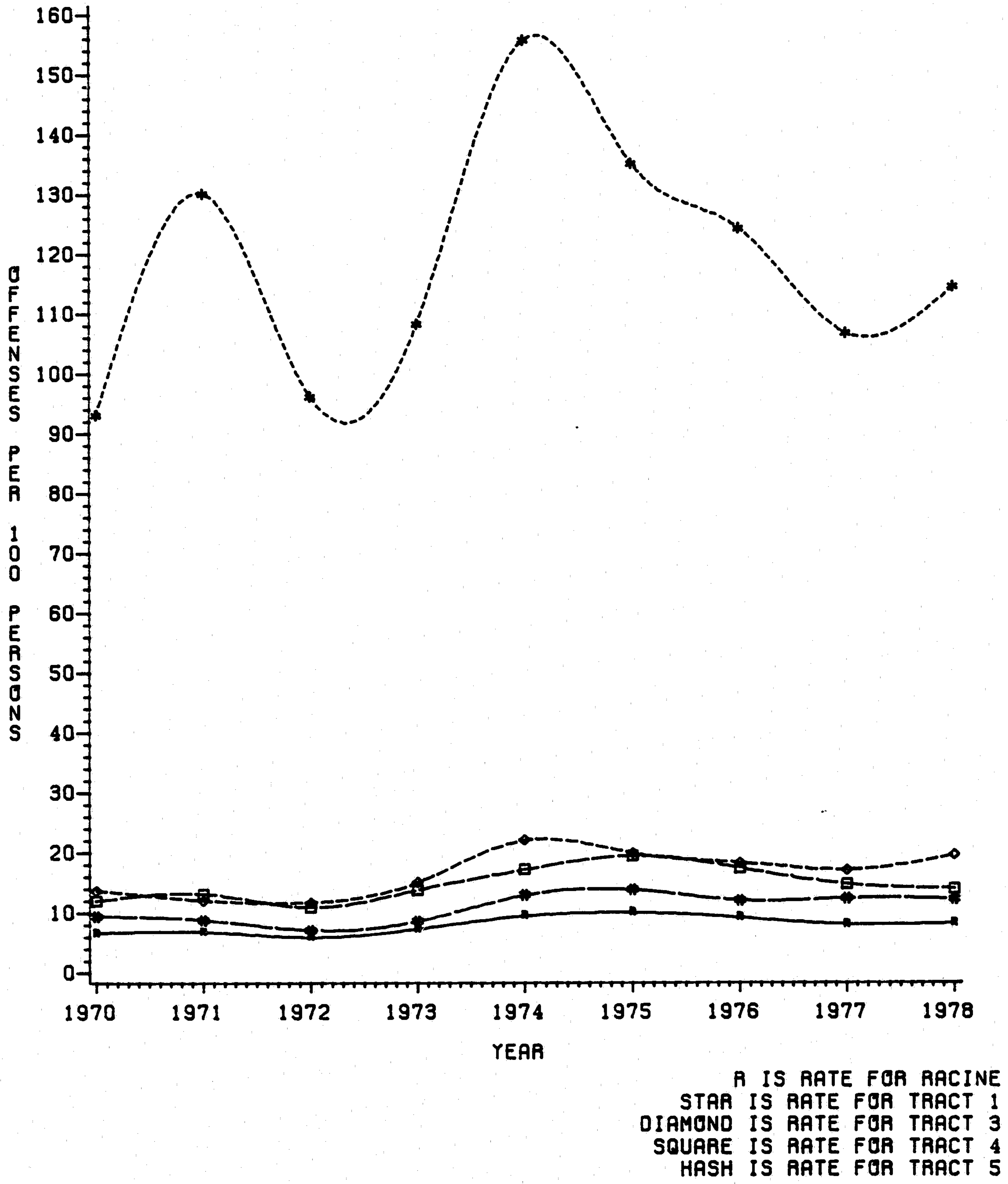
Very large and continuing differences in Part I Offense rates were apparent from tract to tract. Inner city Tracts 1, 3, 4, and 5 had rates far above those for the city as a whole, as shown in Graph 1. Note that Part I Offenses have by far the highest rates in Tract 1, far higher than those for Tracts 3, 4, and 5. Tracts 3, 4, and 5 are plotted again in Graph 2 to show how their variation is overshadowed by the scale in Graph 1. Tracts 2 and 12 (Graph 3) had rates just above those for the city while Tract 9 followed Racine trends very closely. Already we see that aside from the inner city tracts offense rates within tracts are not entirely consistent with expectations based on the categorization of tracts shown in Table 2 of the last chapter. Tracts 6, 7, 8, 10, 11, 13, and 14 had rates slightly lower than those for the city, as may be seen in Graphs 4 and 5.

None of this spatial variation or that described in the remainder of this chapter should be surprising to persons in the justice system or to professionals who work with delinquents and criminals. However, methodological notation of this pattern must be made as a prelude to the more sophisticated analyses which we shall describe in chapters which follow.

GRAPH 1.

PART I OFFENSES PER 100 PERSONS

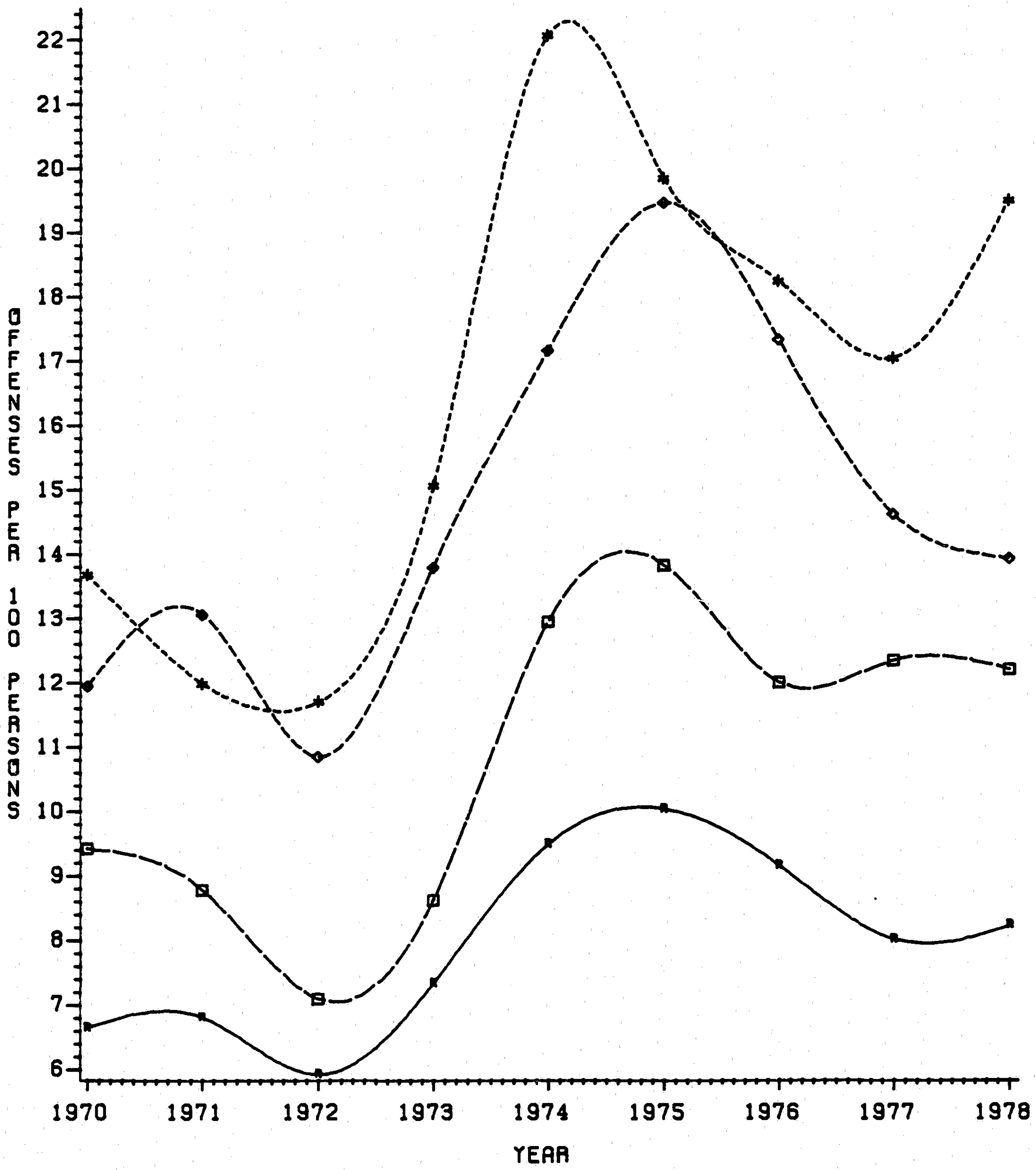
TRACTS 1, 3, 4, 5 AND RACINE



GRAPH 2.

PART I OFFENSES PER 100 PERSONS

IN CENSUS TRACTS 3, 4, 5 AND RACINE

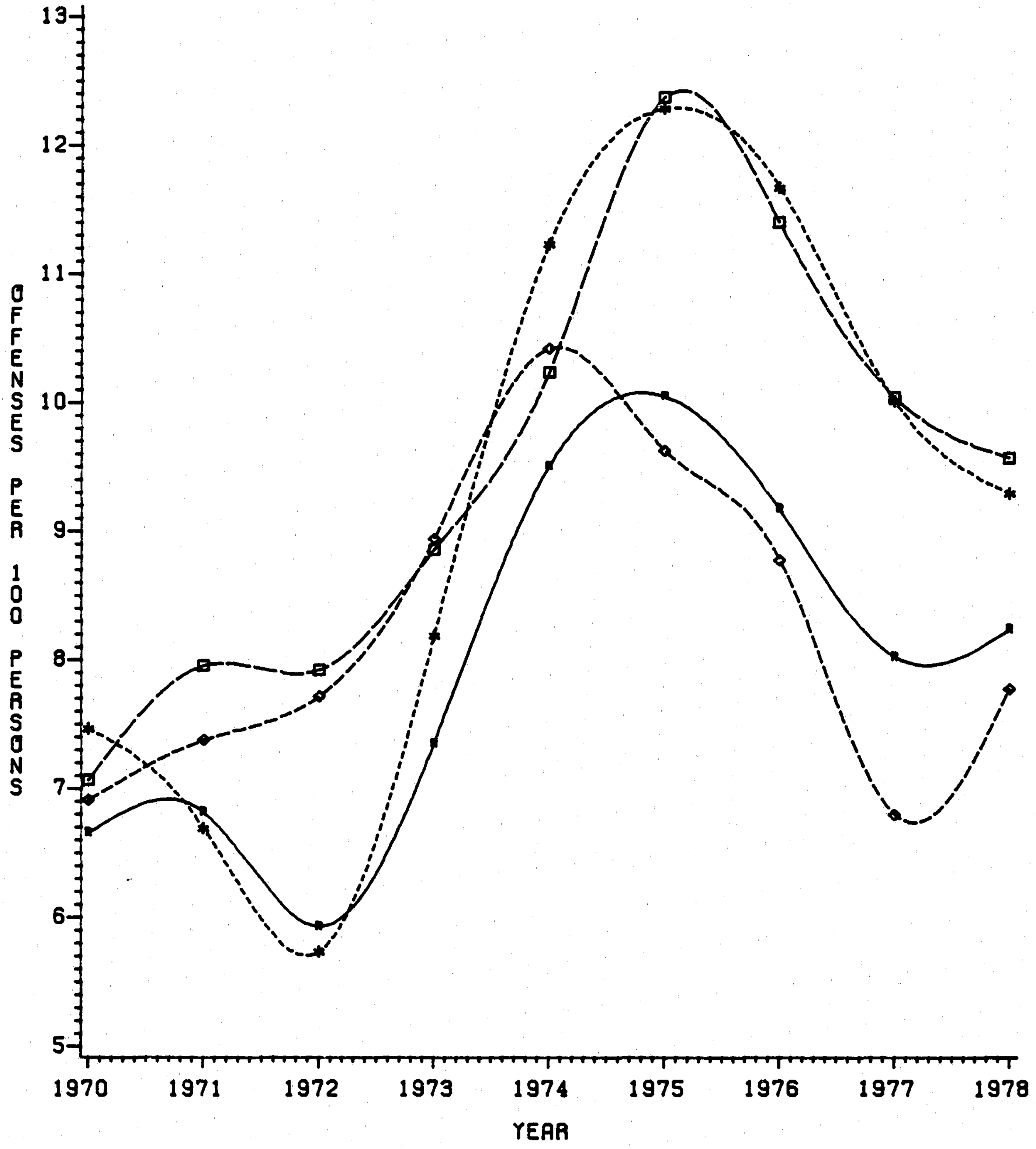


R IS RATE FOR RACINE
STAR IS RATE FOR TRACT 3
DIAMOND IS RATE FOR TRACT 4
SQUARE IS RATE FOR TRACT 5

GRAPH 3.

PART I OFFENSES PER 100 PERSONS

TRACTS 2, 9, 12 AND RACINE

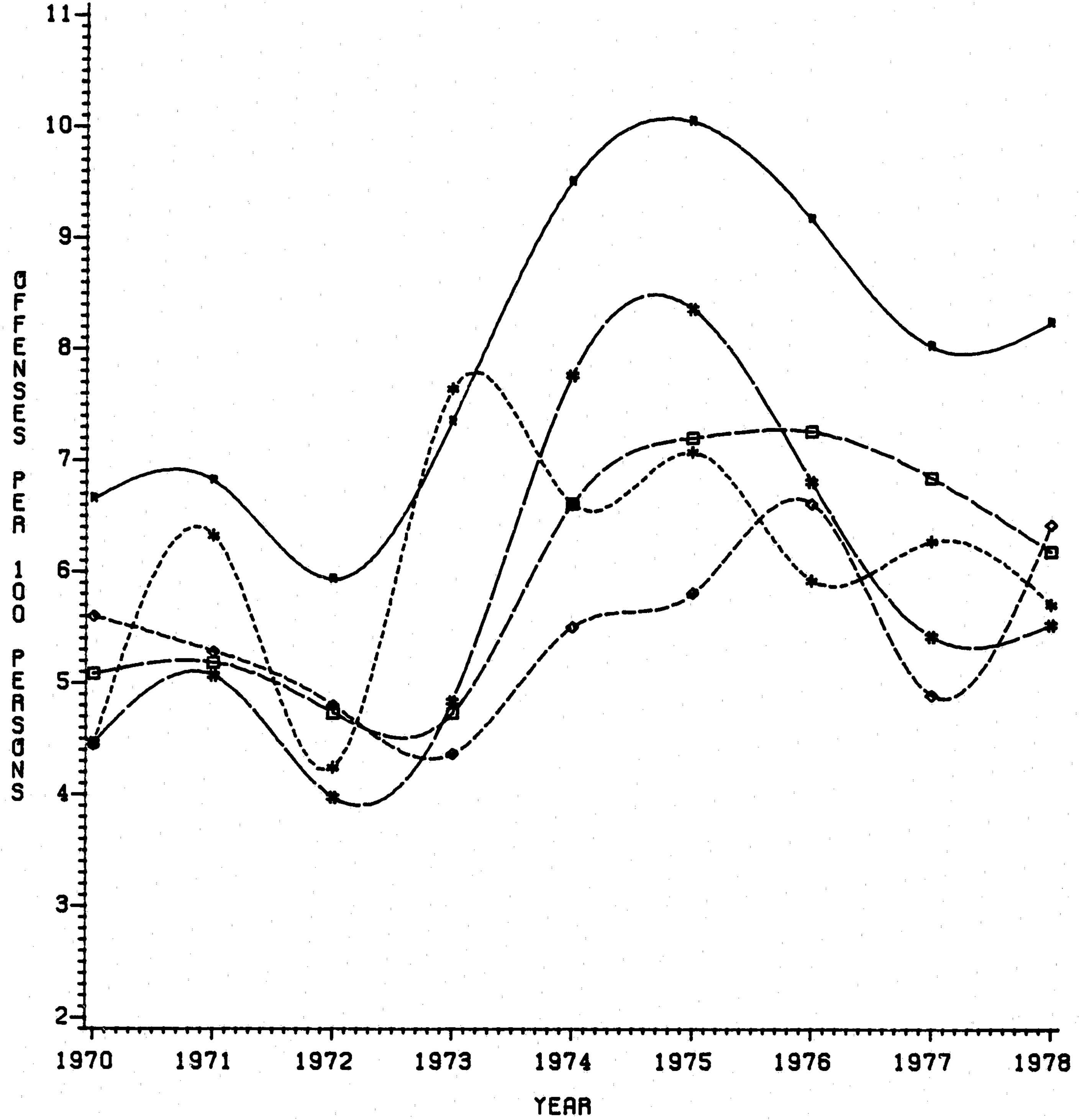


R IS RATE FOR RACINE
STAR IS RATE FOR TRACT 2
DIAMOND IS RATE FOR TRACT 9
SQUARE IS RATE FOR TRACT 12

GRAPH 4.

PART I OFFENSES PER 100 PERSONS

TRACTS 6, 7, 10, 13 AND RACINE

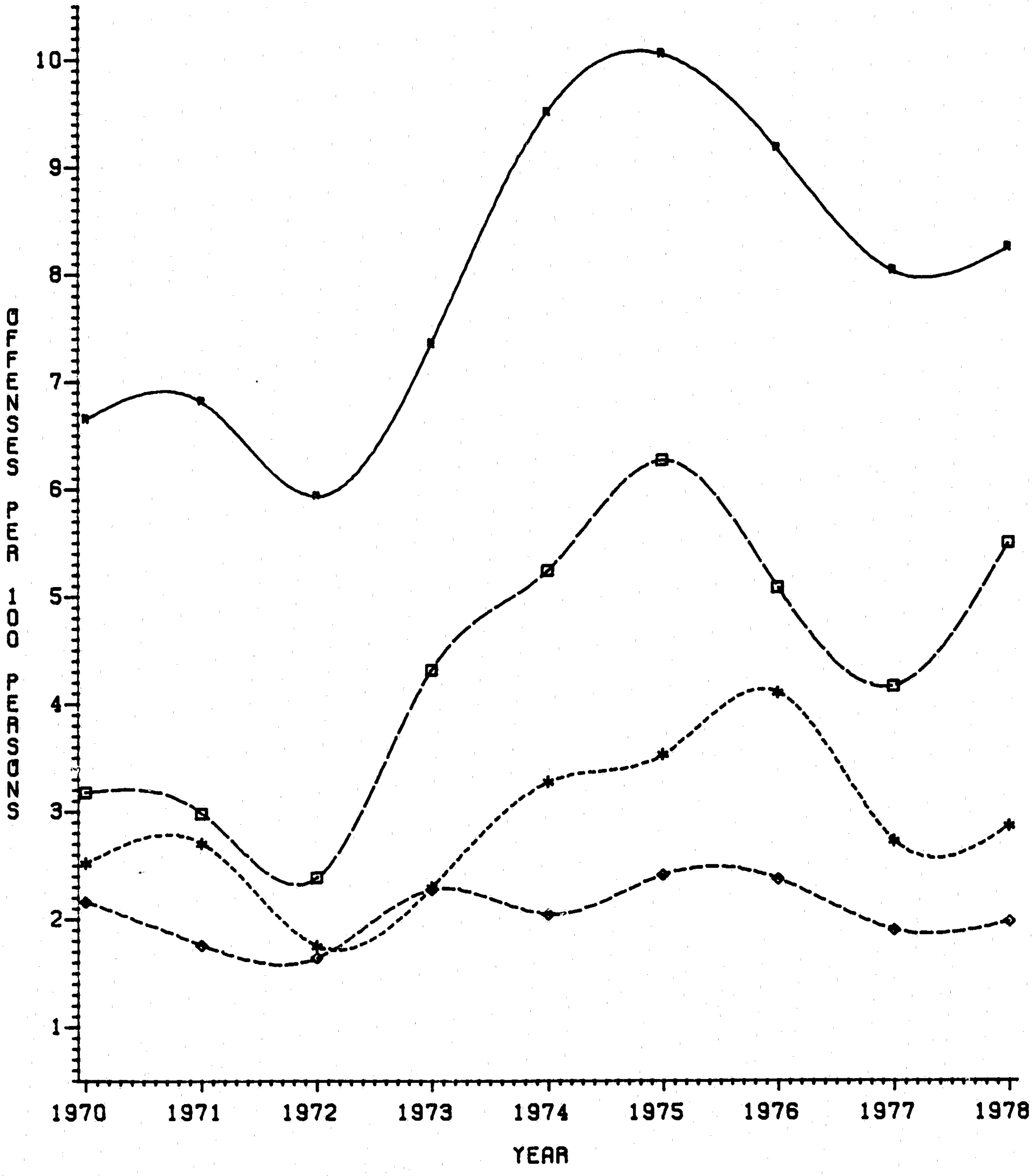


R IS RATE FOR RACINE
STAR IS RATE FOR TRACT 6
DIAMOND IS RATE FOR TRACT 7
SQUARE IS RATE FOR TRACT 10
HASH IS RATE FOR TRACT 13

GRAPH 5.

PART I OFFENSES PER 100 PERSONS

TRACTS 8, 11, 14 AND RACINE



R IS RATE FOR RACINE
STAR IS RATE FOR TRACT 8
DIAMOND IS RATE FOR TRACT 11
SQUARE IS RATE FOR TRACT 14

RESIDENCE OF PERSONS ARRESTED BY PART I AND II OFFENSES BY CENSUS TRACTS

Offenses were not broken down by type in this data set but were available by sex and race/ethnicity. There were 3.02 arrests per 100 population in Racine in 1966, rising to a peak of 6.08 in 1975 and declining to 3.90 in 1978. There was considerably more variation in year of peak arrest rates by tract of residence than there was for tract of offense. The arrest rate in Tract 1 peaked in 1970, in Tract 6 in 1972, in three other tracts in 1974, in six other tracts in 1975, and in three tracts in 1976.

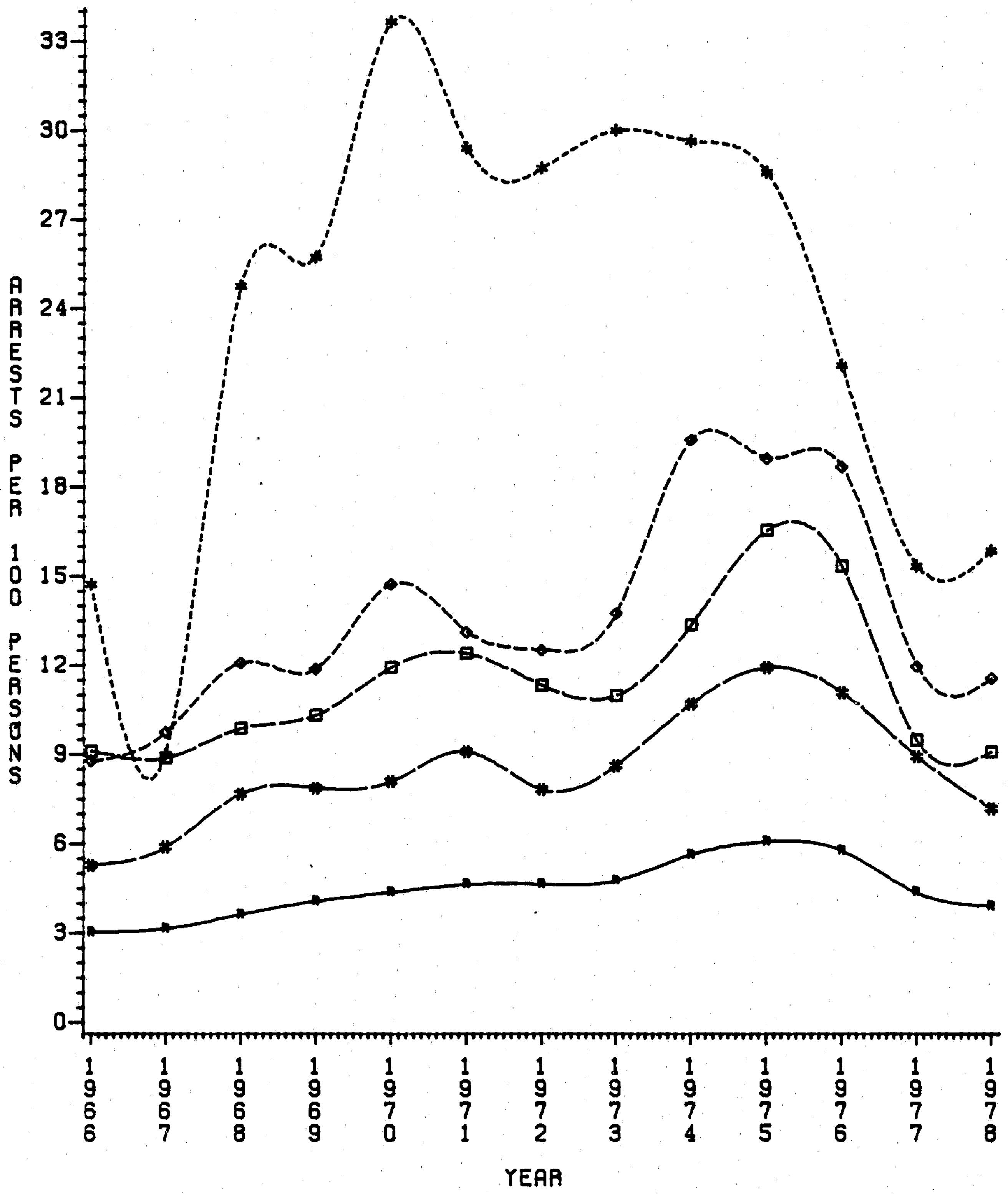
While there was considerable variation in arrest rates by tract of residence, it was not as great as that by tract of offense, as shown in Graphs 6 through 9. Inner city Tracts 1, 3, 4, and 5 (Graph 6) had rates which exceeded those for the city every year. Arrest rates for Tracts 2, 7, 8, and 9 (Graph 7) fluctuated just above or below rates for the entire city. Tracts 10, 12, and 13 had low rates (Graph 8) and Tracts 6, 11, and 14 had the lowest rates quite consistently (Graph 9). Again, it is apparent that observed tract arrest rates vary from those which would be expected based on the classification of tracts in Table 2 of the last chapter. This makes the enterprise more exciting. How can we account for unexpected findings so early in the research?

It is also apparent that changes in the juvenile proportion of the population from tract to tract over the years has resulted in some interesting shifts in the proportion of all arrests that

GRAPH 6.

PART I-II ARRESTS PER 100 PERSONS

RESIDING IN CENSUS TRACTS 1, 3, 4, 5 AND RACINE

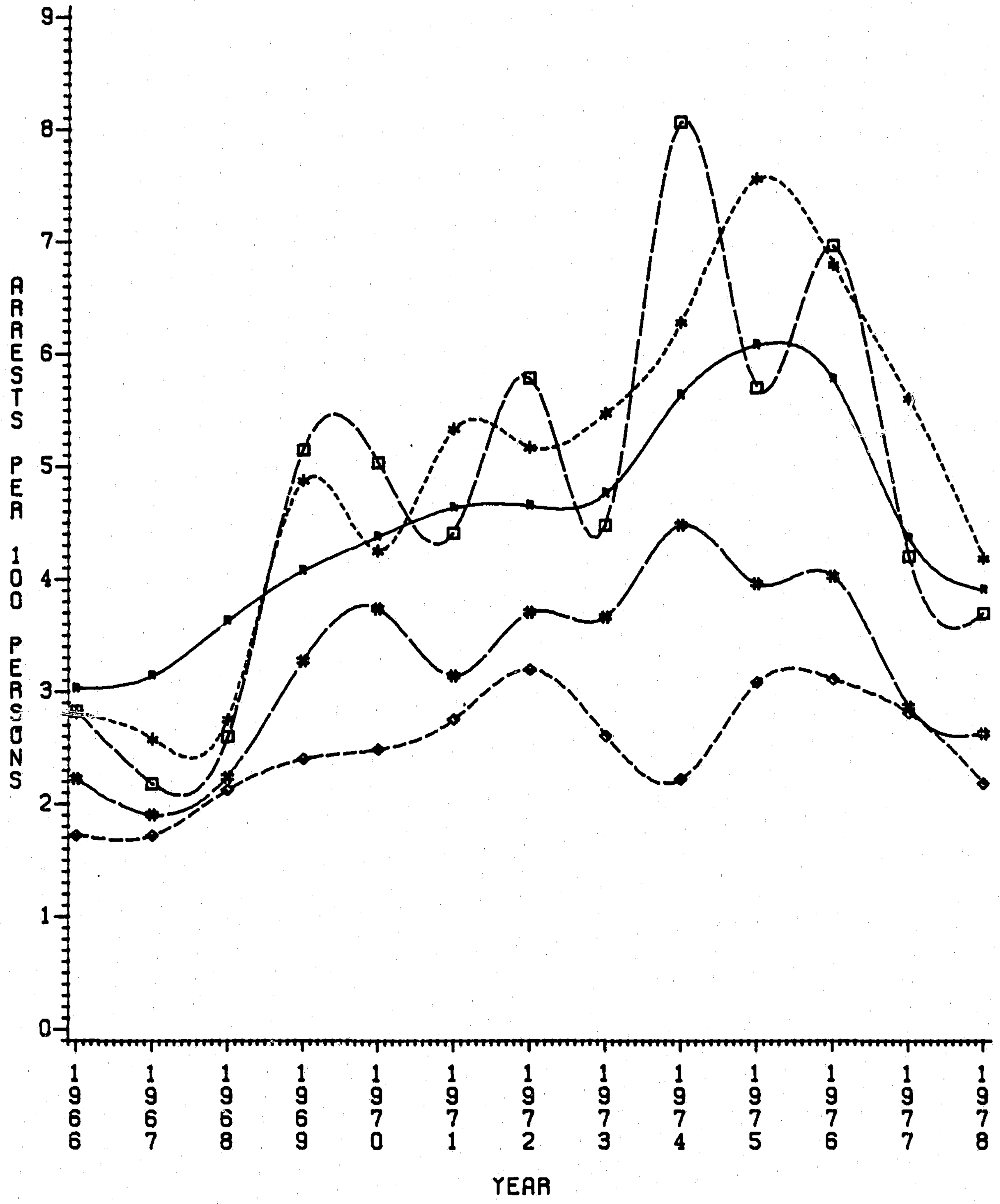


R IS RATE FOR RACINE
STAR IS RATE FOR TRACT 1
DIAMOND IS RATE FOR TRACT 3
SQUARE IS RATE FOR TRACT 4
HASH IS RATE FOR TRACT 5

GRAPH 7.

PART I-II ARRESTS PER 100 PERSONS

RESIDING IN CENSUS TRACTS 2, 7, 8, 9 AND RACINE

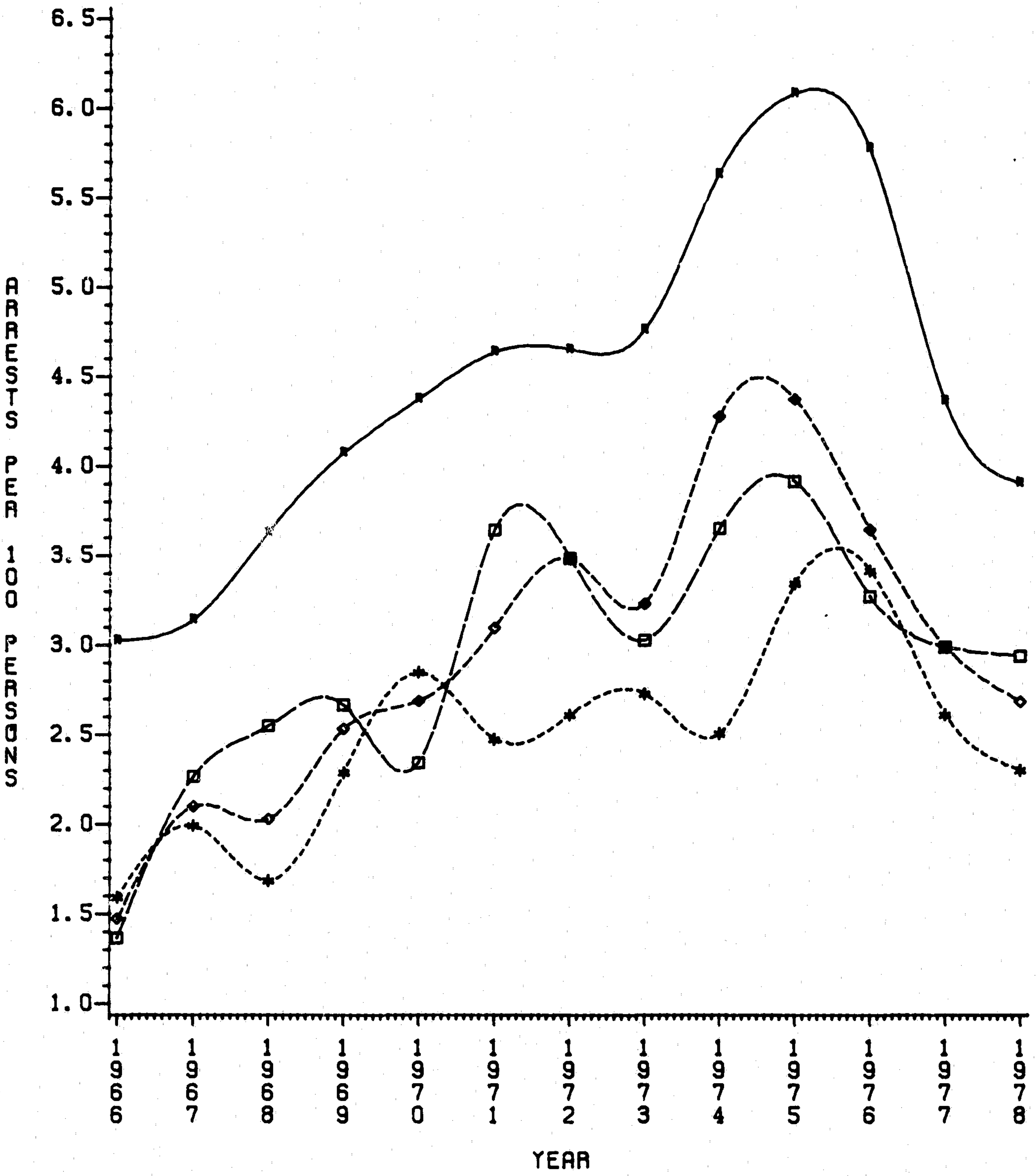


R IS RATE FOR RACINE
STAR IS RATE FOR TRACT 2
DIAMOND IS RATE FOR TRACT 7
SQUARE IS RATE FOR TRACT 8
HASH IS RATE FOR TRACT 9

GRAPH 8.

PART I-II ARRESTS PER 100 PERSONS

RESIDING IN CENSUS TRACTS 10, 12, 13 AND RACINE

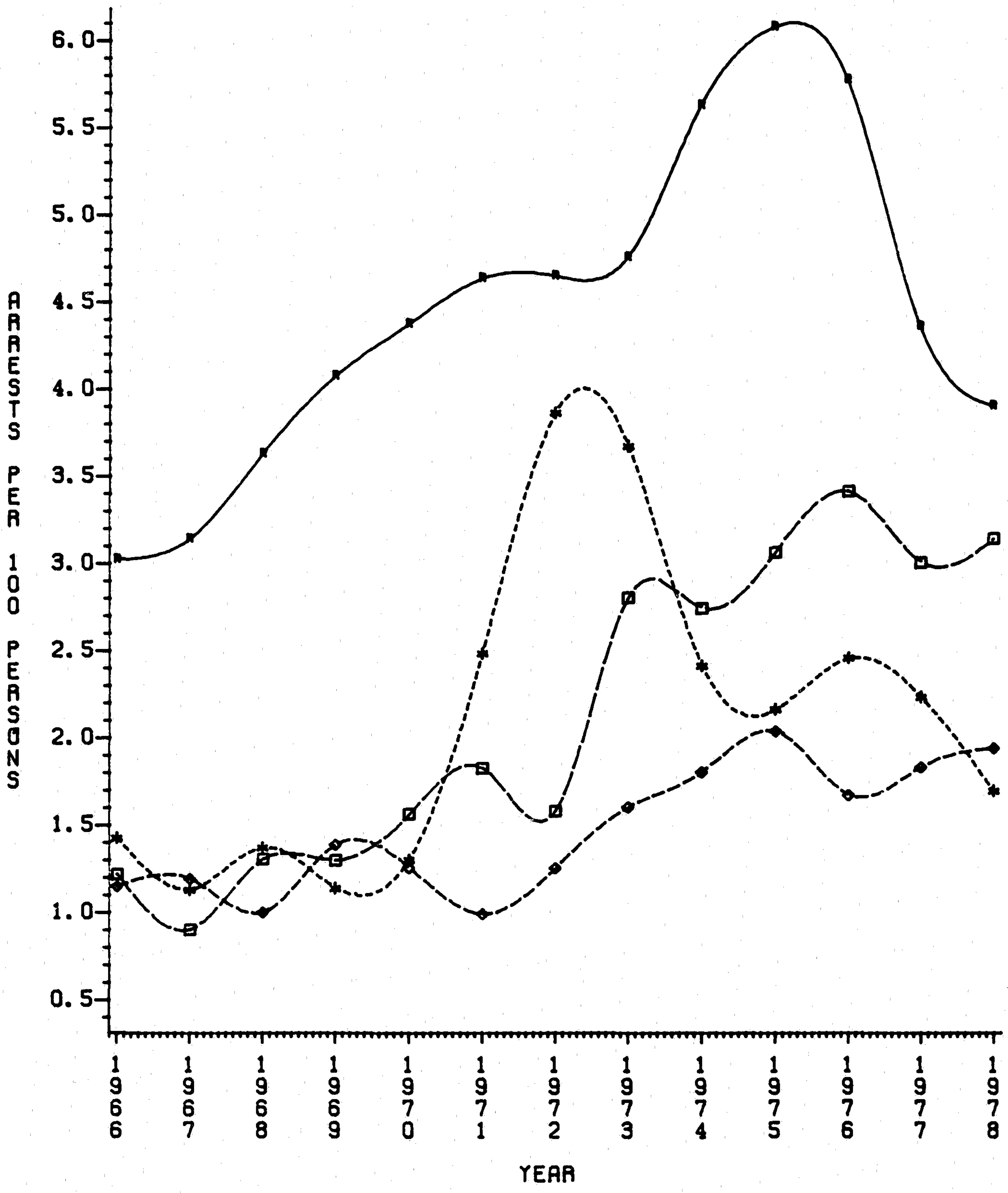


R IS RATE FOR RACINE
STAR IS RATE FOR TRACT 10
DIAMOND IS RATE FOR TRACT 12
SQUARE IS RATE FOR TRACT 13

GRAPH 9.

PART I-II ARRESTS PER 100 PERSONS

RESIDING IN CENSUS TRACTS 6, 11, 14 AND RACINE



A IS RATE FOR RACINE
STAR IS RATE FOR TRACT 6
DIAMOND IS RATE FOR TRACT 11
SQUARE IS RATE FOR TRACT 14

were juvenile arrests in some tracts. For example, Tracts 3 and 4 contained 15% and 26%, respectively, of the juvenile arrests in 1966 but this had declined to 9% and 11% by 1978. Each of these tracts contained 19% of the adult arrests in 1966 but had shown less decline to 14% and 13% by 1978. Only slightly over half of the adult male arrests in 1966 were from Tracts 3, 4, and 5 with a reduction to 40% by 1978. By contrast, well over half (56%) of the arrests of male juveniles were in these tracts in 1966 with a reduction to only 31% by 1978. Among the adult females, 61% of the arrests were of those residing in Tracts 3, 4, and 5 in 1966 with a reduction to 55% by 1978. But for the juvenile females the 55% of arrests from these tracts in 1966 had been reduced to 43%. In essence, male and female juvenile delinquency, as measured by arrests, was moving outward more rapidly than adult crime.

This may be seen in another way by noting the percent of those arrested each year who were juvenile vs. adult. Among the Racine males arrested the percent of those who were juveniles commenced at 42.4% in 1966, rose to a high of 60.2%, remained at 55% or above until 1974, and then declined to 43.9%. However, there was immense variation from tract to tract in the proportion of juvenile vs. adult arrests and in the trend from 1966 to 1978. In only three years did juveniles constitute more than 10% of those arrested in Tract 1. In Tracts 3, 4, and 5 the percent of the males arrested who were juveniles rose from 1966 to high points in the early 1970s but declined to considerably lower proportions by 1978 than at the outset. By contrast, during the same period the proportion of juvenile arrests in Tracts 6, 7, and 8 showed significant increase. In Tract 8, the extreme case, the juveniles constituted 36.7% of the arrests in 1966 and reached 61.8% by 1978.

Similar changes were taking place among the females. Although they did not parallel the male changes in all tracts, in Tract 7 the juvenile proportion of female arrests increased from 33.3% to 61.9% over the 13-year period. There were also tracts in which the juvenile proportion of female arrests far exceeded the juvenile proportion of male arrests in a consistent pattern over a period of 13 years. In Tract 9, for example, there was not a single year when the juvenile proportion of the female arrests was below 50% and in most years it was above 60%; in Tract 10 it was 70.8% in 1966 and rose to 81.0% in 1978. In sum, the juvenile proportion of female arrests decreased in the inner city and interstitial areas but increased in all other areas.

Race/ethnic differences were also apparent. The percent of White juvenile arrests from Tracts 3, 4, and 5 declined from 35.8% to 14.8% between 1966 and 1978. The adult decline was from 34.6% to 26.8%. While most arrests of Blacks were of those residing in Tracts 3, 4, and 5 in 1966 (91.4% of adult arrests and 97.3% of juvenile arrests), the proportion of the arrests of Blacks who resided in these tracts had declined for both by 1978, moreso for the juveniles than the adults (75.7% of the adult and 68.3% of the juvenile arrests were of those who resided in these tracts). Decline in the proportion of arrests of Chicanos from these tracts followed a similar pattern, from 71.2% to 55.5% for adults and 82.0% to 56.7% for juveniles.

Although delinquency by residence of juveniles has been moving outward, the inner city tracts remain centers of delinquency and crime by place of offense and those who reside there continue to have high offense rates. We shall return to this phenomenon as changing spatial rates of delinquency and crime are discussed more fully. It was concluded that variation in arrest rates by tract should be analyzed without controls for sex and juvenile/adult status because we are concerned with the basic overall change in arrest rates. Even though there are differences in rates by race/ethnicity and sex, the general pattern of change is there for all groups.

PLACE OF OFFENSE BY POLICE GRID AREAS

With this data set it is possible to look at Part I Offenses by months and years from 1968 through 1979. One of the phenomena which must be considered is the degree to which rates fluctuate seasonally and the fact that variation on a seasonal basis may be as great as or greater than that found over longer periods of time. These fluctuations were plotted and it was found that January and July differences in number of offenses committed was, in many years, as great as or greater than the difference in number of offenses committed in January of 1969 and January of 1979. In Police Grid Area 12 (the extreme inner city area) seasonal fluctuation became greater and greater, particularly during peak years. In an area with a smaller number of offenses, Grid 4 for example, the fluctuation was even more apparent. The same pattern of seasonal fluctuation was found for theft for the city and for these grids. Since our concern is whether or not long-term trends in delinquency and crime are related to the changing social organization of the city as change produces variation in the characteristics of areas within spatial systems, these seasonal fluctuations may be ignored for the purposes of this research.

When Part I in-area offense rates by police grids are considered, we must again examine the problem of differences in rates by type of offense. Offenses against the person and property are correlated .905, assault and rape are correlated .921, and burglary and theft .880, the latter being the two offenses with the greatest frequency of occurrence, followed by assault. Although some of the less frequently occurring offenses have relatively low or inverse correlations with other offenses, the basic trend for crime within areas is well represented by Part I Offenses regardless of type.

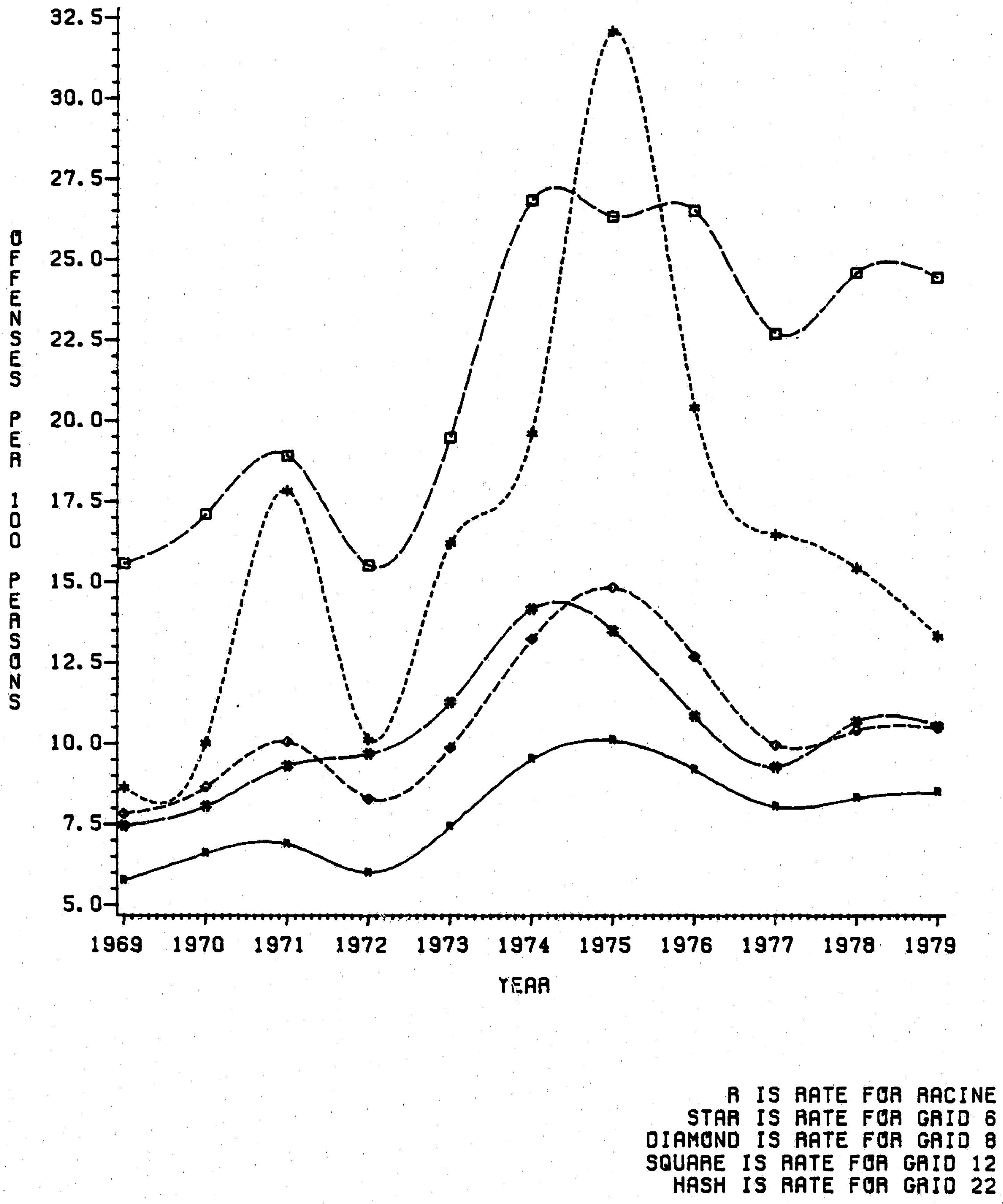
Offenses against both property and persons peaked in 1975. Although rates for most of the 20 grids also peaked in 1975, two achieved their highest rate a year earlier, five a year later, and one in 1977. Police Grid Areas 1 and 23 had their highest offense rates against persons in 1979 and Grid 5 in 1978. Grid 12 had its highest rate against persons in 1974 but has continued at this level most years since that time. Grid 14 came close to its peak in 1974 and continued high, reaching its peak in 1978. Grids 17 and 18 did the same but their highest rates came in 1979. These are variations from the generally high points that came in 1974 and 1975. By contrast, the property offense rates reached their peak in most grid areas by 1975, three in the year before and five in the year after.

However interesting some deviations for particular types of offenses from the general trend may be (robbery had its peak year in high SES Grid 1 in 1978, but still only eight robberies that year), to keep the analysis to a manageable form requires that the rate for all Part I Offenses be taken as an index for most of the analyses to be conducted.

Before leaving this brief introduction to the Police Grid Area data set, comment must be made on the overall variation from grid to grid in comparison with the rate for the entire city. Several grids showed rates that were considerably above those for the city, Grids 6, 8, 12, and 22 (Graph 10). Grids 8 and 12 were expected to have high rates but 6 and 22 were not. Rates for specific offenses show that Grid 6, a peripheral area with low population but one that attracts large numbers of people for recreational purposes, had one of the highest robbery, burglary, and assault rates in the city in 1975 and the highest theft rate in 1975 and 1976. Some of the police grid areas in Graph 11 were expected to have high rates and others relatively low rates but all were close to those for the entire city. Grids 1, 2, 4, 14, 18, and 20 had relatively low rates and Grids 10, 21, and 23 had

GRAPH 10.

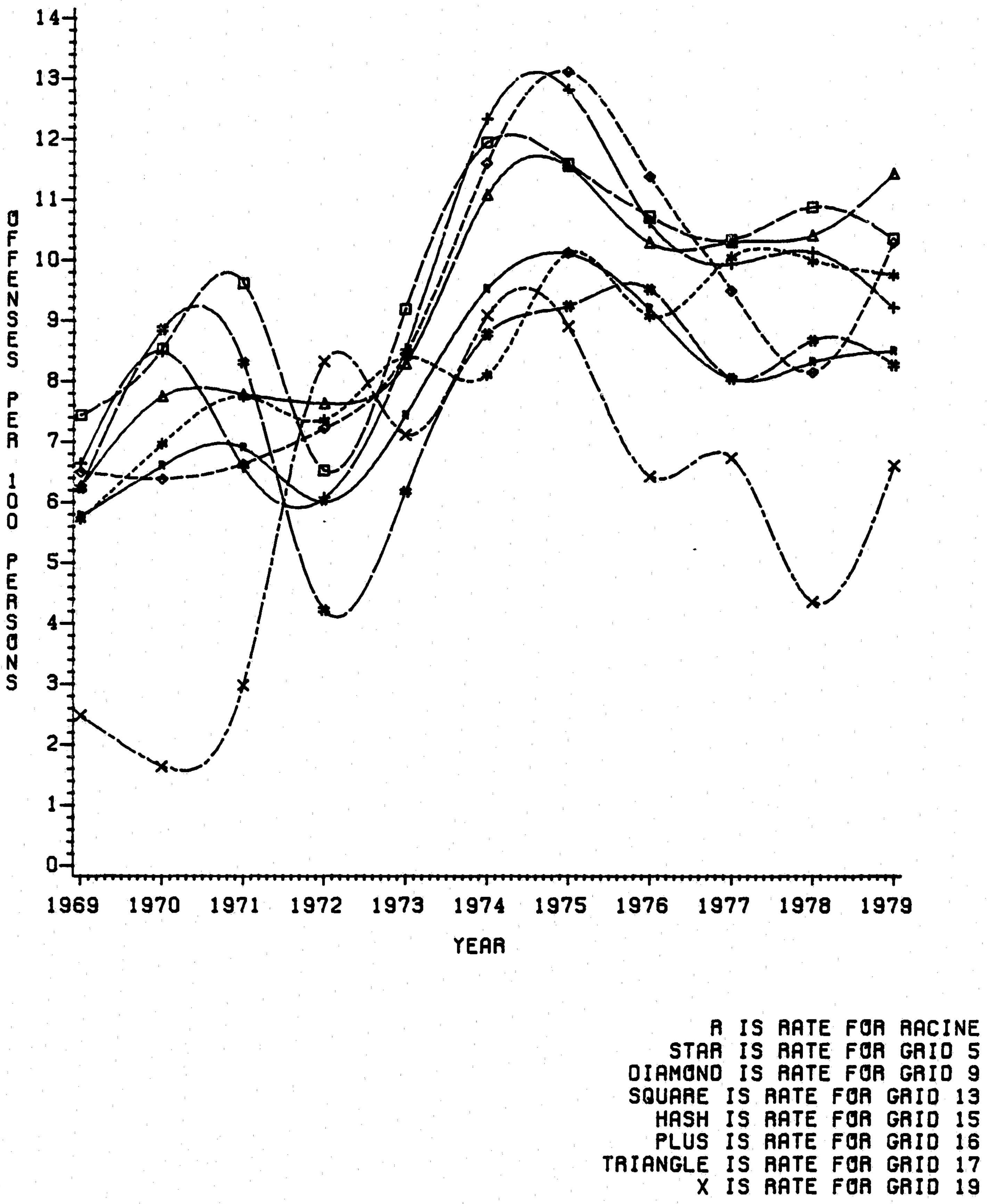
PART I OFFENSES PER 100 PERSONS IN POLICE GRIDS 6, 8, 12, 22 AND RACINE



GRAPH 11.

PART I OFFENSES PER 100 PERSONS

IN POLICE GRIDS 5, 9, 13, 15, 16, 17, 19 AND RACINE



the lowest rates (Graphs 12 and 13). All of the police grids shown on Graphs 12 and 13 are middle and upper socioeconomic status areas. We must again conclude that a preliminary inspection of variation in offense rates finds considerably less than a perfect relationship between rates and the ecology of the city.

THE COHORT DATA SETS

Three cohorts of male and female juveniles (each person was identified as White, Black, or Chicano) were selected from the files of the Racine Unified School District.

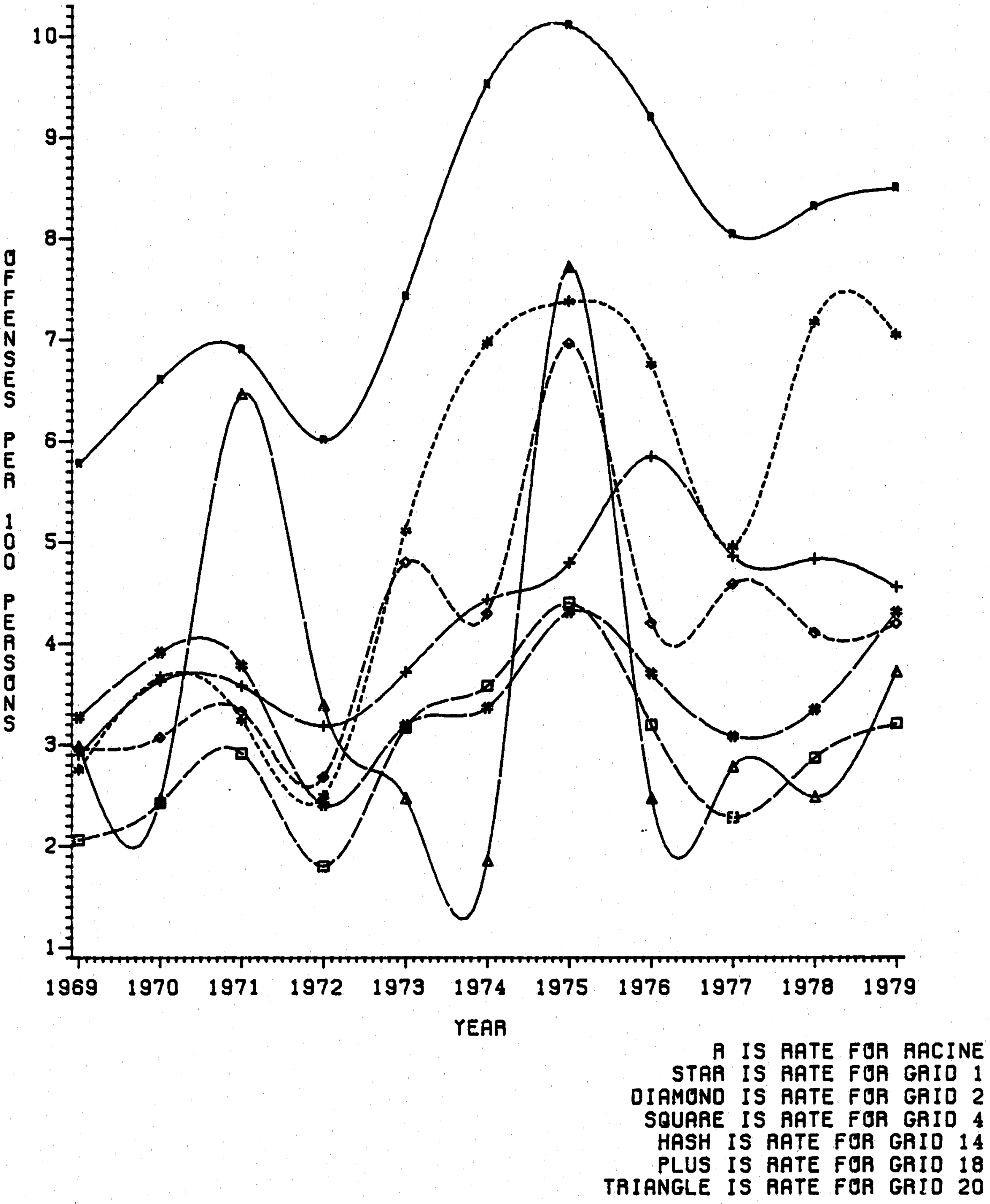
The first cohort, born in 1942, consists of 1,352 persons, the second, born in 1949, consists of 2,099 persons, and the third, born in 1955, consists of 2,676 persons.[1] Their names (the married names of females in each cohort were obtained from the records of the County Health Department) have been followed through the Records Division of the Racine Police Department in order to ascertain the total number and nature of police contacts of each person in each cohort.

The point upon which most persons agree is that when using either official records of delinquency or self-reported delinquencies, some quantitative index of seriousness of career is necessary. Whether a delinquent career conists of a single or several offenses, the number of offenses is not a satisfactory measure of its seriousness. Some single offenses may be quite serious and indicative of a career while others may be of a minor, chance, or accidental nature. Exactly how to combine

GRAPH 12.

PART I OFFENSES PER 100 PERSONS

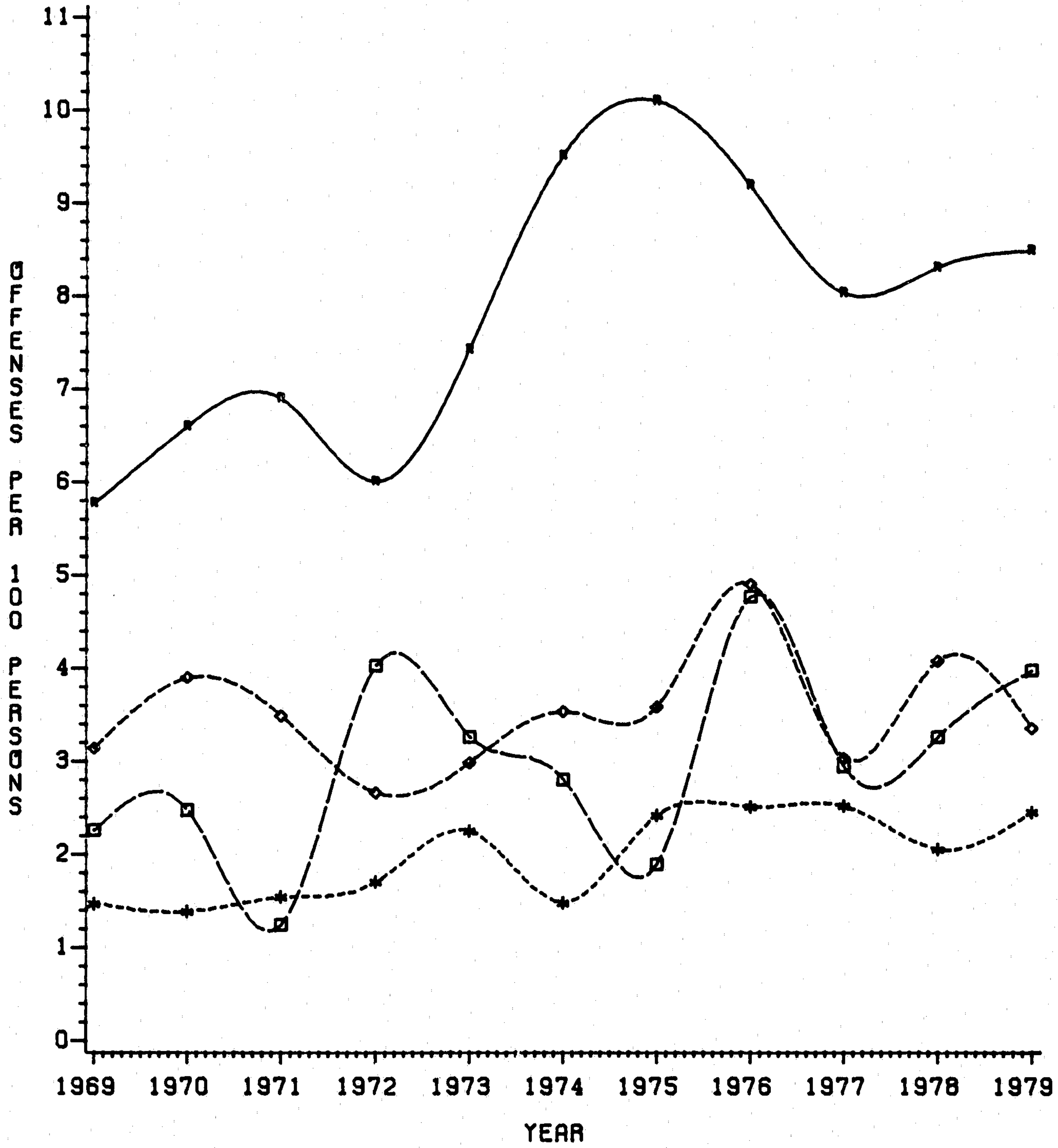
IN POLICE GRIDS 1, 2, 4, 14, 18, 20 AND RACINE



GRAPH 13.

PART I OFFENSES PER 100 PERSONS

IN POLICE GRIDS 10, 21, 23 AND RACINE



R IS RATE FOR RACINE
STAR IS RATE FOR GRID 10
DIAMOND IS RATE FOR GRID 21
SQUARE IS RATE FOR GRID 23

different types of offenses with different rates of occurrence and different orders of priority has been a question of theoretical and practical concern for many years.[2]

Each of 26 police contact categories (reasons for police contact) were arranged in six levels of seriousness in terms of its classification as a felony against the person, a felony against property, a major misdemeanor, a minor misdemeanor, a juvenile condition (status offense), or a contact for suspicion, investigation, or information. While this may seem to be a more or less arbitrary arrangement, it is consistent with police reporting and decisions of the Records Division of the Racine Police Department as to whether or not the act should be considered a felony or a misdemeanor.

The length of time all cohort members resided in the community (whether they had contact records or not) was determined in order to be able to control for those with only partial careers.[3] This was, in a sense, the old problem of mortality in longitudinal studies, except that we were immediately concerned with those who entered the system later than their birth date (for all practical purposes later than age 6) and with those who left Racine before the age of 18.

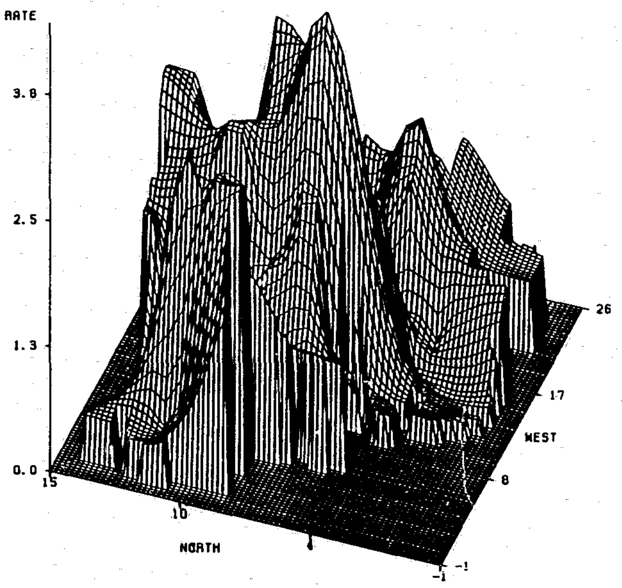
The address at which the offender lived at time of contacts and addresses where contacts occurred were coded for each contact according to a block numbering system established by the U.S. Census in 1970. Each block was assigned a unique set of Cartesian coordinates so that addresses of offenders and places of contact could be computer-related to or mapped with controls for any other variable. Thus it is possible to computer-create visual representation of the distribution of police contacts by place of residence or place of contact according to type of offense, etc.

Maps 1, 2, and 3 are presented as examples of the cohort police contact data. They were drawn with neighborhoods containing fewer than five cohort members excluded (peripheral neighborhoods for the 1942 Cohort and commercial-industrial or other non-residential areas for the 1949 and 1955 Cohorts) so that several peripheral neighborhoods with anomalous rates would not partially block out our view of the remainder of the city. This procedure also eliminated the central business district for the 1942 and 1955 Cohorts, thus modifying those maps considerably from that for the 1949 Cohort but otherwise permitting a better view of pertinent features of the city's delinquency typography.

One cannot help but discern the differentiation from cohort to cohort in rates of police contacts per cohort member from neighborhood to neighborhood during the ages of 6 through 17 at the same time that the mean for the city increased markedly between the 1942 Cohort (1.321) and the 1949 Cohort (1.936) but very little from the 1949 to the 1955 Cohort (2.068). Neighborhood variation does not take such a dramatic form for the 1949 Cohort because inclusion of the inner city as a neighborhood creates a scale in which other neighborhood differences are minimized. The reader may also wish to relate the changing shape

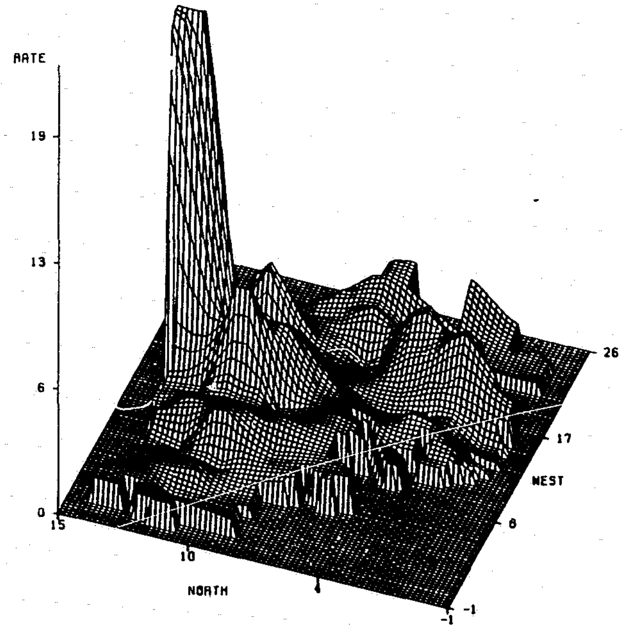
MAP 1

MEAN NUMBER OF JUVENILE CONTACTS: 1942 COHORT
BY NEIGHBORHOOD OF JUVENILE RESIDENCE



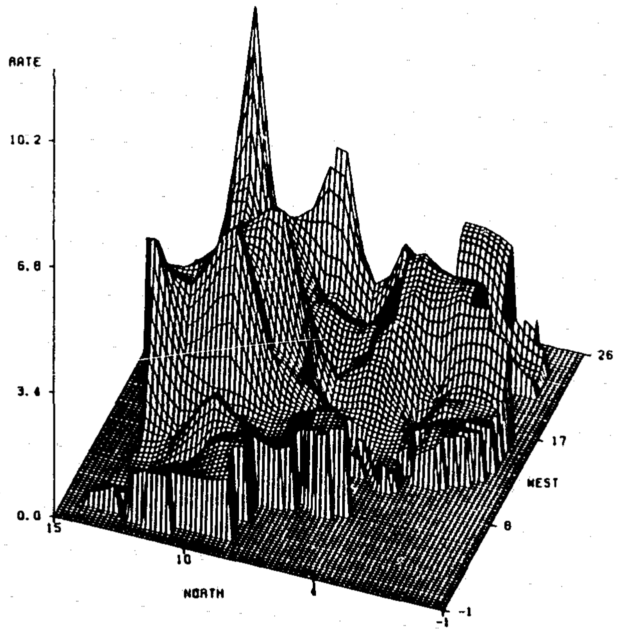
MAP 2

MEAN NUMBER OF JUVENILE CONTACTS: 1949 COHORT
BY NEIGHBORHOOD OF JUVENILE RESIDENCE



MAP 3

MEAN NUMBER OF JUVENILE CONTACTS: 1955 COHORT
BY NEIGHBORHOOD OF JUVENILE RESIDENCE



of police contacts for the three cohorts during the juvenile period to the changing shape of ecological variables shown in the previous chapter in order to obtain a glimmer of the complexity of relationships.

Disposition of those cases which were referred to the Juvenile Court, Misdemeanor Court, and Felony Court were coded and added to each person's record. This completed the delinquent and criminal career of each person in each cohort. Analyses could be conducted not only of continuities and discontinuities in careers but it could also be determined if careers (number of contacts, seriousness of contacts, number of referrals, and severity of sanctions scores) increased or decreased for those who moved to areas regarded as more likely to be productive of delinquency than their past area of residence or the opposite if they have moved to what would be considered a better area.[4]

The cohort data have been described in other publications in which we were interested in change from cohort to cohort and were less concerned with spatial variation in time.[5] To facilitate these analyses it was necessary to code residences of all persons with continuous residence into a convenient set of time periods: 1950 through 1959; 1960 through 1969; and 1970 up to 1976. Thus there is a usual place of residence for most people in the cohorts (even if they had no contacts) that corresponds to the periods for which we have been able to characterize areas with data from the U.S. Census.[6]

The next issue to be addressed in this chapter is that of the spatial representativeness of each of the cohorts during the periods which have been described for various areas. There is always a question as to whether a given cohort is representative of all cohorts that could have been selected; we dealt with that problem by selecting three cohorts. Thus, age, period, and cohort variation are captured by these data. The question remains, however, is there cohort spatial variability that generates problems when the analysis is directed toward changing patterns of spatial relations? We think not; rather we see such variation in the spatial distribution of cohorts as indicative of population change in the city. A series of three cohorts facilitates a dynamic type of analysis. But, rather than attempt to simply settle the issue by argument, we examined the spatial distribution of the members of each cohort in relation to that of Racine's population at these same time periods. Racine's population 1950 to 1980 by tract, grid, natural area, and neighborhood gave us an idea of what proportion of each cohort should have each area as their place of principal residence, 1950 through 1959, 1960 through 1969, and 1970 through 1976. Although there were some discrepancies, the overall distribution of the three cohorts by census tracts was considered sufficiently close to that of the population to be representative by their places of residence.[7] A similar approach was taken for police grid areas, natural areas, and neighborhoods, with the conclusion that the spatial representativeness of cohorts was not a problem that would distort findings.[8]

THE INTERVIEW DATA SETS

The interview data sets are based on interviews with 889 persons from the 1942 and 1949 Cohorts. They are utilized in showing the extent to which self-reports on delinquency and crime, self-concepts, explanations of delinquent behavior, reactions to detection and apprehension, and explanations of cessation of delinquent behavior are related to the social organization of the city.[9]

The question arose of representativeness of persons interviewed from each of the cohorts. Inner city and interstitial tracts and grids were underrepresented in the interviews, particularly Tract 2 and Grid 12, and peripheral tracts and grids were overrepresented, particularly Tract 12 and Grid 21. In no other case was a cohort systematically underrepresented or overrepresented in each time period. Except in those tracts and grids with very small numbers of persons from one or both cohorts, the cohort statistic could be considered representative of persons in the space from that cohort.

Self-report data (in addition to interview questions) were obtained from a separate check-off sheet. They are available for three age periods (6-17, 18-20, and 21 and older). Sixteen items were included ranging from running away from home to armed robbery. Scores on the scale were based on the frequency and seriousness of offenses reported.[10]

SUMMARY

Changing rates and patterns of Part I Offenses may be described by place of offense for Census Tracts (1970-1978) and Police Grid Areas (1968-1979). Changing rates and patterns of arrests for Part I and II Offenses may be described by place of residence of the persons arrested for Census Tracts (1966-1978). The total police and court experience (official and self-report) of three cohorts may be described by census tracts, police grid areas, natural areas, and neighborhoods.

FOOTNOTES

[1] The police contact data set described in this section and the interview data set were collected under LEAA Grant Numbers 76 JN-99-0008, 76 JN-99-1005, and 77 JN-99-0019, and with funds provided by The Max C. Fleischmann Foundation.

[2] For an early study of this problem, see: Sophia M. Robison, Can Delinquency be Measured?, New York: Columbia University Press, 1936. More recently, a variety of more or less sophisticated scaling techniques (in addition to those cited in other references on the problem of measurement) have been utilized: Thorsten Sellin and Marvin Wolfgang, The Measurement of Delinquency, New York: John Wiley and Sons, 1964, particularly Chapters 5, 8, 18, and 20; R.I. Martin and M.W. Klein, A Comparative Analysis of Four Measures of Delinquency Seriousness, Los Angeles: University of Southern California, Youth Studies Center, 1965; Travis Hirschi and Hanan C. Selvin, Delinquency Research: An Appraisal of Analytic Methods, New York: The Free Press, 1967; and Marvin E. Wolfgang, Robert M. Figlio, and Thorsten Sellin, Delinquency in a Birth Cohort, Chicago: The University of Chicago Press, 1972.

[3] We were fortunate in having a set of Racine City Directories for 1947 through 1977 present in our office and were able to borrow telephone directories from the Wisconsin Bell Telephone Company for the period covered by the study for Racine, Kenosha, and surrounding areas.

[4] The possibility of those without continuous residence in Racine differing from others (movers vs. stayers) has been dealt with in Michael R. Olson, A Longitudinal Analysis of Official Criminal Careers. Unpublished Ph.D. dissertation, University of Iowa, Iowa City, Iowa, 1977.

[5] Lyle W. Shannon, "A Longitudinal Study of Delinquency and Crime," Quantitative Studies in Criminology, Beverly Hills: Sage Publications, 1978, pp. 121-146; Lyle W. Shannon, "Assessing the Relationship of Adult Criminal Careers to Juvenile Careers," in Clark C. Abt (ed.), Problems in American Social Policy Research, Cambridge: Abt Books, 1980, pp. 232-244; and Lyle W. Shannon, Assessing the Relationship of Adult Criminal Careers to Juvenile Careers. A Final Report to the National Institute for Juvenile Justice and Delinquency Prevention, August 1980, 950 pp.

[6] This did not really solve all of the problems but it gave some idea of the extent to which members of the cohorts moved about the community and permitted determination if their distribution was roughly proportional to the distribution of Racine's population within each spatial system. The extent of the mobility problem is revealed by the fact that even after collapsing census tracts into six groups of similar tracts, 52.1% of the 1942 Cohort had moved to a different SES level tract between 1950 and 1960 and 38.5% of the 1949 Cohort had done so. When police grid areas were collapsed in six similar levels the figures were 53.5% for the 1942 Cohort and 35.8% for the 1949 Cohort. Slightly larger figures were obtained when the natural

areas and neighborhoods were collapsed into seven levels. When moves between 1960 and 1970 were dealt with in the same fashion we found that from 62.9% to 67.9% of the 1942 Cohort had moved to a different level, as had from 61.4% to 65.5% of the 1949 Cohort and even from 27.8% to 34.2% of the 1955 Cohort. In addition, as high as 9% of the 1942 Cohort and 14% of the 1949 Cohort had moved to tracts or other areas outside the city between 1950 and 1960, as had similar percentages of one or the other of the three cohorts between 1960 and 1970. All of this makes it difficult to follow the delinquent and criminal careers of sizeable groups within each area of the various spatial systems over a period of time, a forewarning of the complexity of some of the analyses that will be presented with cohort data.

[7] It was possible to look at the 1942 and 1949 Cohorts three times and the 1955 Cohort twice. Arbitrarily setting the rule that the proportion of a cohort in an area during a given period should not deviate by more than 2% from the proportion of the population in that area at the start and end of the 10-year period, it could be decided how frequently out of eight possibilities the cohort had a greater or lesser proportion of its members in the area than the population of the city. This was a rather rough measure because the age distribution of the youthful population is different from that of the total population. Tract 2 had fewer persons than expected but this tract was noted for its low percent of the population ages 5 through 17, having 23% in 1970 compared to 30% or more in other

inner city tracts so that this apparent discrepancy would not be a defect in the spatial distribution of youth and young adults in the cohorts. Tract 5 had fewer than expected from the 1942 and 1949 Cohorts during the 1970s but that could be explained by the greater outward mobility of young people than older people, Tract 5 also being an inner city tract. Tracts 6, 8, and 9 also had a few more persons from one or the other of the cohorts than expected (all had more than expected from the 1942 Cohort) during the 1970s but we have already indicated that youth have moved outward disproportionately to older persons. The only other tract with consistently higher or lower proportions than expected was Tract 13, which had more than expected in the 1960s from the 1942 Cohort but fewer than expected from the 1949 Cohort and for the latter during the 1970s as well.

[8] Since there are more police grid areas than tracts and some outlying grids had very small populations in the 1950s and 1960s, the problem of representativeness may be greater, particularly if we set the arbitrary limit for variation at 1.5%. We find that Police Grid Areas 8, 12, 13, 16, and 17 have one or more instances in which a cohort had fewer persons than expected in an area but in only Grid Area 12 was this the case for every cohort or at least one cohort in each time period. Grid 12 encompasses the central business district and Grids 8, 13, 16, and 17 are either inner city or partially transitional areas so our comments about the juvenile population and more rapid movement of the younger population outward explain these observed differences.

Only Grid Area 21 had more persons than expected from each cohort in each time period. This area on the southwestern edge of the city had more than doubled in population between 1950 and 1960 and was in one of the directions of general population movement during the period from 1950 into the 1970s. When the cohorts were combined, Area 12 had fewer persons from them during the 1950s and 1960s and Areas 21 and 22 had more than expected. All in all, however, taking into consideration population movement, this disproportional representation of youth and young adults, as in other similar but less marked divergencies, is not likely to mean that the cohorts were overrepresented in the peripheral areas.

Similar results were obtained when the population of natural areas was compared with the distribution of the cohorts, arbitrarily placing deviation of 1.5% plus or minus for any cohort in an area during a time period in the disproportional representation category. Natural Area 1 had fewer persons from the 1949 and 1955 Cohorts during the 1960s and 1970s and fewer than expected from the 1942 Cohort during the 1970s. Each cohort had a period in which it was underrepresented in Natural Area 5. Since both were inner city, this followed the previous pattern of deviation. Although the 1942 Cohort had more persons than expected in each time period in Area 13, an area which had grown during the 1950s before declining, this too was consistent with the population movement previously mentioned. Areas 9, 11, 14, 17, 19, 20, 21, and 24 also had at least one time period when one or two of the cohorts was disproportionately represented but there were no other patterns of systematic disproportional representation. All of these, of course, were also likely to have occurred because younger families had been moving from the inner city and interstitial areas. When the three cohorts were combined they remained underrepresented in only Areas 1 and 5 in the inner city and were not overreprsented in the peripheral areas, underrepresentation in one cohort in a given time period cancelling out overrepresentation in another.

Assessing the neighborhood representativeness of cohort members is a bit more difficult. No neighborhood contained more than 5% of the population any year 1950-1980, and most neighborhoods were in the range from 1% to 3% of the population each year, particularly in 1980. The same was true for the distribution of members of the three cohorts for the three time periods. It was decided that 0.5% deviation by the cohort from the population should be arbitrarily set as an indication of deviation from the expected proportion of the cohort in the neighborhood. This resulted in fewer cohort persons from at least one cohort in at least one time period for every inner city area and for some of the interstitial and transitional areas. Most of the outlying areas had more than expected in one or more time periods from one or more cohorts. Since very small numbers were involved in a large share of the neighborhoods, the probability of discrepancies of this nature was great, particularly in the less densely populated, smaller neighborhoods. When the cohorts were combined most neighborhood discrepancies disappeared with all except five confined to the inner city. Of the seven inner city areas with disproportional representation, only one had more persons than expected. Also considering the fact that more than twice as many discrepancies were from the 1942 Cohort as the 1949 and 1955 Cohorts together, the smaller number of persons in the 1942 Cohort spread throuhout more than 60 neighborhoods, and spatial differences in the age composition of the population, we should not have expected each cohort of relatively young people to be distributed throughout the city proportionately to the entire population. We shall, of course, eliminate neighborhoods that have too few cohort members for a reliable statistic whenever necessary.

9 The 1960 and 1971 interview data set was helpful in characterizing the areas in each spatial system, not only to reveal differences in people's attitudes from area to area but also to show that there is considerable heterogeneity within larger areas based on race/ethnic differences but also heterogeneity within race/ethnic groups within areas. This, if nothing else, demonstrated our awareness of the problem of aggregating people to spaces.

The 1976 interviews with samples of the 1942 and 1949 Cohorts permit further examination of differences in people from area to area, keeping in mind that there is much variation within areas. Perhaps the most interesting are the questions on perception of police patrolling in their neighborhoods, percent with no friends in trouble with the police, and percent with a negative attitude toward the police. The problem with questions such as these, however, is whether attitudes and behaviors were precursors to delinquency or products of delinquent encounters.

Responses to some questions sharply differentiated between inner city and peripheral residential tracts, such as percent with high-level present occupation (which simply verifies the existing ecological structure of the city), while responses to others failed to differentiate between the inner city and peripheral areas.

Similarly, the inner city and peripheral natural areas differ markedly on responses to some questions but not on others. For example, the questions dealing with the police generated more anti-police or police contact experiences responses for most inner city areas than for peripheral areas. On the question about having adult friends in trouble with the police, inner city respondents replied in the affirmative more often than did peripheral area respondents from the 1949 Cohort but such differences were not that apparent for the 1942 Cohort.

[10] Self-report seriousness scores based on the frequency with which respondents admitted engaging in various delinquent and criminal activities from least to most serious types of acts were utilized in the construction of several sets of tables paralleling those presented in this chapter for census tracts, police grid areas, natural areas, and neighborhoods.

Respondents were given a check-off sheet on which they indicated the frequency in which they engaged in the following behaviors for each age period, 6-13, 14-17, 18-20, and 21 and older: 1) speeding or other traffic offenses, 2) drinking beer, wine, or liquor before legal age, 3) taking something from a store or business without paying, 4) anything like stealing a bicycle or hubcaps off cars, 5) thrown things at cars, lit firecrackers, done something that "disturbed the police," or other things that could be considered disorderly conduct, 6) intentionally destroyed, damaged, or marked up any property that would cost more than $20 to repair, 7) taken a car or motor vehicle without the owner's consent, 8) beaten up, fought, or physically attacked another person, 9) driven a car or motor vehicle while under the influence of alcohol or other drugs, 10) used any kind of weapon to take something from another person, 11) been stopped by the police and questioned about something you were doing, 12) entered a house, apartment, or building when you should not have been there, 13) used any pills or drugs such as speed, downers, mushrooms, peyote, or LSD, 14) carried a concealed weapon such as a gun, knife, chain, or any other object that might have been used against another person, 15) used marijuana. Scales were developed from the responses to these items based on frequency and seriousness of responses for each age period.

Examination of the seriousness scores for the age periods 6 through 17, 18 through 20, and 21 and older revealed the not unexpected finding that persons from inner city Census Tract 5 in both cohorts and at every age period had very high average scores but those who resided in Tract 4, another inner city tract, had lower than average scores for both cohorts in every age period. Those who resided in Tract 7 from the 1942 Cohort had low scores but those from the 1949 Cohort had high scores, evidence of transition that we had not found in the official police records, but Tract 13 had average or lower self-report scores for the 1942 Cohort and very high self-report scores for persons from the 1949 Cohort. Although Police Grid Area 9, a transitional area, had low self-report seriousness scores for its 1942 Cohort members and high scores for the 1949 Cohort, there were grids that were inconsistent with what would be expected based on official police records. Similar consistencies and inconsistencies were present in tables for natural areas and neighborhoods. There has been a substantial literature on differences between the self-report and official records of police contact with the conclusion that while there is some congruence, there is always a degree of underreporting and overreporting related to socioeconomic status and race/ethnicity.

Chapter 4. The Relationship of Delinquency and Crime to the Ecology of the City: An Analysis of Census Tracts and Police Grid Areas

A non-statistical description of the relationship of spatial variation in juvenile delinquency and crime to the characteristics of census tracts and police grid areas, two of the four spatial systems that we have utilized, is presented in this chapter.

CENSUS TRACT VARIATION IN OFFENSES AND ARRESTS

The problem of characterizing trends was mentioned as we noted that rates tended to rise from the late 1960s or early in the 1970s and to 1975 at the latest in most cases. This raises the question of which year's rates to use in describing trends (rates and changes in rates) within census tracts. Procedures for determining whether irregular data are best represented by a single slope or a two-segment slope were utilized in making this decision. Since 80% to 90% of the arrests are of males rather than females, tests were first conducted based on the number of adult males arrested by census tract of residence.[1] In only Tracts 1 and 6 was curvilinearity statistically significant. In all other tracts the best two-segment lines did not provide a closer fit to the number of male arrests than did a one-segment stable or upwardly-sloping line. Indication of a downward trend came in 1974 in seven tracts but was not significant. In four other tracts, all peripheral, the trend in number of arrests continued upward or there was such a modest break as to produce a line that was still very close to being straight.

The same procedures were next utilized for all arrests, juveniles and adults, males and females combined, still not taking differences in population trends within tracts into consideration, i.e., number of arrests were used rather than rates per 100 persons residing in an area. The downward turn in sheer number of arrests in Racine in 1975 is significant. This trend, while present to some extent in most tracts, was significant only in inner city Tracts 2, 3, and 5. Tract 4 came close to being a two-segment line. In all other tracts the trend was best represented by a straight line.

Graphs were also constructed based on arrest rates for Racine and the individual tracts; rates for Racine were best represented by a straight line, with only Tract 1 better represented by a two-segment line. Rates for Tracts 2, 3, 4, and 5 rose from 1966 to 1974 or 1975 and then had a downward turn, in each case less sharp than that generated by number of arrests. Rates for other census tracts fitted a one-segment line even better than before. This suggests that even though we have mentioned tract rates as having increased during the late 1960s and early 1970s before declining, the downward trend in the last half of the 1970s may not be a significant feature in overall trends when considering arrest rates by place of residence of persons arrested. The reader may wish to refer back to Graphs 6 through 9 in Chapter 3 where the scale magnifies annual variation in arrest rates for tracts and the rate for Racine is shown on each graph in addition to rates for a similar group of census tracts. But there are basic differences in arrest rates from one group of tracts to another and this is the most relevant feature of the tract data to be taken into consideration when describing the relationship of delinquency and crime to spatial differentiation within the city.

Although the same statistical analyses were not carried out for Part I Offense rates within tracts, the problem of trends was apparent from perusal of Graphs 1 through 5 in the last chapter. While offense rates in most census tracts rose during the early 1970s to 1974 or 1975 and then declined to 1978, as highlighted by Graphs 2 through 5, the combined tracts were shown as a fairly straight line on Graph 1, as were Tracts 3, 4, and 5. It should be noted that while a quadratic curve appeared to provide the best fit to the trend for Racine when the data were plotted on a scale of from 0 to 10 contacts per 100 persons and would fit some of the tracts, and others were best represented by a straight or two-segment line, a straight line would fit most tracts if all were placed on the same scale as that required for Tract 1.

For the purpose of the analyses to be conducted it was decided that the periods 1966 through 1969, 1970 through 1974, and 1975 through 1978 should be separately characterized for arrest rates and that the periods 1970 through 1974 and 1975 through 1978 should be separately characterized for place of offense data.

POLICE GRID AREA VARIATION IN PLACE OF OFFENSE

The police grid area rates discussed in this section have been divided into three time periods, 1968 through 1969, 1970 through 1974, and 1975 through 1979. Temporal variation was shown by Graphs 10 through 13 in chapter 3 for police grid areas. The extent to which this variation must be considered a problem in analysis parallels that of census tracts. In seven of the police grid areas, a two-segment line best fitted the temporal progression in rates, the downward trend coming in 1975 (two cases in 1974) and in 13 others a one-segment curve seemed most appropriate. Only one of the grids with a downward slope did not have a declining population and five of the seven were inner city or interstitial areas. But most important, every one of the seven had a high place of offense rate in 1975 even though there was a decrease after that. Also, considering the fact that the rate for the city declined after 1975, it was decided that, as with census tracts, concern should be with the basic differences in rates from one police grid area to the other rather than with that segment in the temporal trend of some grids which was not characteristic of the area during the longer span of time for which data were available.

We are now able to proceed to a first look at delinquency and crime and the ecology of the community as indicated by differences in areas in each of the spatial systems that have been utilized.

AN INITIAL PREDICTION OF OFFENSE AND ARREST RATES FROM THE CHARACTERISTICS OF CENSUS TRACTS AND GRIDS

One way to take a first look at these relationships is to make up a table in which an expectation of rates and trends is presented for each of the official sets of rates for census tracts and grids based on what we know about each area (tables in Appendices A through E). These data, when considered in reference to a general theory of delinquency and crime, enable us to specify areas in which offense rates will be highest (as was done in Chapter 3 when tract and grid curves were considered) and in which residents will have the highest arrest rates.[2] This is consistent with classical ecological theory with its emerging variants which suggests that delinquency and crime are more likely to be generated in one kind of milieu than in another and are the products of interaction among people in circumstances which make conventional behavior only one of the possible responses to life situations.

Table 1 presents an expected rate and trend and, opposite it, an observed rate and trend. In each column of observed rates and trends we have underlined that rate or trend which differed from the expected. In most cases what we expected was close to what we found. Nonetheless, it is apparent that our simplistic model of expected rates and trends did not take into consideration all of the variables that are crucial in explaining the rate of offenses in areas or the rates of arrests of persons who reside in them. While general relationships are represented by a table of this type, the relationship of specific variables

TABLE 1. DELINQUENCY AND CRIME RATES AND TRENDS: OBSERVED AND HYPOTHESIZED BY POLICE GRID AREAS AND CENSUS TRACTS

Police Arrest Rates for Part I and II Offenses by Census Tract or Residence		Part I Offenses Committed Within Census Tracts		Part I Offenses Known to Police in Police Grid Areas	
Expected Rate and Trend Based on Population and Housing Characteristics in 1970	Observed Rate and Trend from Official Police Records 1966-1978	Expected Rate and Trend Based on Population and Housing Characteristics in 1970	Observed Rate and Trend from Official Police Records 1970-1978	Expected Rate and Trend Based on Population and Housing Characteristics and Change 1950-1980	Observed Rate and Trend from Official Police Records 1969-1979
Inner City				Inner City	
1 High Stable	High Inc. to '73	High Inc.	High Inc. to '74	8 High Inc.	High Inc. to '75
3 High Inc.	High Inc. to '76	High Inc.	High Inc. to '74	12 High Inc.	High Inc.
4 High Inc.	High Inc. to '75	High Inc.	High Inc. to '75	13 High Inc.	Med. Inc.
5 High Inc.	High Inc. to '75	High Inc.	High Inc.	16 High Inc.	Med. Inc. to '75
Heterogeneous Older Transitional				Transitional	
2 Med. Inc.	Med. Inc. to '75	High Inc.	Med. Inc. to '75	9 Med. Inc.	Med. Inc. to '75
13 Med. Inc.	Med. Inc. (Fluct.)	High Inc.	Med. Stable	17 Med. Inc.	Med. Inc.
6 Med. Inc.	Low Inc. (Fluct.)	Med. Inc.	Med. Stable	20 Med. Inc.	Low Fluct.
7 Med. Inc.	Low Inc. (Fluct.)	Med. Inc.	Med. Stable		
Middle to High SES				Stable Residential	
10 Med. Inc.	Low. Inc.	Med. Inc.	Med. Stable	18 Med. Stable	Low Inc.
12 Med. Inc.	Low Inc. to '75	Med. Inc.	Med. Inc.	21 Med. Inc.	Low Stable
8 Med. Inc.	Med. Inc. to '74	Low Inc.	Low Stable	14 Low Stable	Low Stable
9 Med. Inc.	Med. Inc. to '74	Low Inc.	Med. Stable	4 Low Stable	Low Stable
Peripheral High SES				Peripheral Middle to High SES	
11 Low Stable	Low Stable	Low Inc.	Low Stable	5 Med. Stable	Med. Inc.
14 Low Stable	Low Inc.	Low Inc.	Low Inc. to Med.	6 Med. Inc.	High Inc. to '75
15 Low Stable	-- --	Low Inc.	-- --	22 Med. Inc.	High Inc. to '74
				19 Low Inc.	Med. Inc. (Fluct.)
				15 Low Inc.	Med. Inc. (Fluct.)
				23 Low Inc.	Low Inc. (Fluct.)
				Peripheral High SES	
				1 Low Stable	Low Inc. (Fluct.)
				2 Low Stable	Low Stable
				10 Low Inc.	Low Stable

* Differences from expected are underlined.

to offense and arrest rates is still unknown, as is the relationship of the latter to the changing characteristics of areas within spatial systems. But whatever may be said about this initial look at relationships, it is apparent that offense rates and arrest rates for the period between the late 1960s and late 1970s are associated with certain static aspects of these spatial systems circa 1960 and 1970 and the dynamics of population growth, inner city expansion, and peripheral development.

A MORE DETAILED VIEW OF THE RELATIONSHIP OF THE CHARACTERISTICS OF CENSUS TRACTS AND GRIDS TO OFFENSE AND ARREST RATES

A word should be said about the rationale for developing the next set of tables. If commencing with an arrangement of spaces based on what may be called "milieu" theory produces a somewhat fuzzy-patterned impression of the relationship of types of areas to rates and trends of offenses and arrests, perhaps we should start with an arrangement of areas by offense or arrest rates and determine if their milieu, as measured by selected variables, systematically differs.[3]

In Table 2, tracts are clustered according to rates and progression to higher rates with those tracts with continuously high rates (the inner city tracts) at the top, descending to those tracts which never reach high rates. Four different measures of the characteristics of census tracts and police grid areas were selected, target density, percent commercial-industrial, percent residential vacancy, and the factor analytic

TABLE 2. RELATIONSHIP OF TARGET DENSITY, LAND USE, VACANCY RATE, HOUSING TYPE, AND CHANGE TO ARRESTS AND OFFENSES KNOWN TO POLICE BY TRACTS*

	1950				1960				1950-1960 Change				Arrests By Residence		1970				1960-70 Change				Arrests By Residence		Place of Offenses		Arrests By Residence		Place of Offenses	
	Target Density	% Comm/Inc	% Res Vacant	Housing Score	Target Density	% Comm/Ind	% Res Vacant	Housing Score	Target Density	% Comm/Ind	% Res Vacant	Housing Score	1966	Change 1966-69	Target Density	% Comm/Ind	% Res Vacant	Housing Score	Target Density	% Comm/Ind	% Res Vacant	Housing Score	1970	Change 1970-74	1970	Change 1970-74	1975	Change 1975-78	1975	Change 1975-78
Inner City																														
1	H	H	L	P	H	H	H	P	Inc	Dec	Inc	Det	H	H Inc	H	H	H	P	Dec	Dec	Dec	Det	H	H Dec	H	H Inc	H	H Dec	H	H Dec
3	H	H	L	P	H	H	H	P	Dec	St	Inc	St	H	M Inc	H	H	H	P	Dec	St	Inc	St	H	H Inc	H	H Inc	H	H Dec	H	L Dec
4	H	H	L	P	H	H	H	P	Dec	Inc	Inc	St	H	L Inc	H	H	H	P	Dec	Dec	Inc	St	H	L Inc	H	M Inc	H	H Dec	H	H Dec
5	H	H	L	P	H	H	M	P	Dec	Inc	Inc	Det	H	M Inc	H	H	H	P	St	Dec	Inc	St	H	M Inc	H	M Inc	H	H Dec	H	L Dec
Early Transition to Higher Arrest Rates																														
2	H	M	M	G	H	M	M	M	St	Inc	St	Det	M	M Inc	M	M	H	P	Dec	Dec	St	Det	M	M Inc	M	M Inc	H	M Dec	H	M Dec
8	L	L	H	G	L	L	L	G	Inc	Inc	Dec	St	M	M Inc	M	L	M	M	Inc	St	St	Det	H	M Inc	L	L Inc	H	M Dec	L	L Dec
9	L	M	M	M	M	M	M	M	Inc	Dec	St	St	M	L Inc	M	M	M	M	Inc	Dec	Dec	St	M	L Inc	M	M Inc	M	L Dec	H	M Dec
7	M	L	M	G	M	M	L	M	St	St	Dec	St	L	L Inc	L	M	M	M	St	Inc	St	Det	M	L Dec	M	St	M	L Dec	M	L Inc
Transiton to Medium Arrest Rates																														
13	H	M	L	M	H	M	M	M	Dec	St	St	Imp	L	L Inc	M	M	M	M	St	Inc	St	Det	L	L Inc	M	M Inc	M	L Dec	M	M Dec
10	M	M	M	G	M	L	M	M	Dec	Dec	St	Det	L	L Inc	M	L	M	M	St	St	St	St	M	L Inc	M	L Inc	M	L Dec	M	L Dec
12	M	H	L	M	L	M	H	M	St	Dec	Inc	Imp	L	L Inc	L	M	M	M	St	Dec	Dec	St	M	L Inc	M	M Inc	M	M Dec	H	M Dec
Low Stable Arrest Rates																														
14	L	L	M	G	L	L	M	G	St	Inc	St	Imp	L	St	M	L	M	G	Inc	St	St	St	L	L Inc	L	L Inc	M	St	M	L Dec
6	M	L	M	M	M	L	M	M	St	St	Dec	St	L	L Dec	L	L	M	M	Dec	St	St	St	L	L Inc	M	L Inc	L	L Dec	M	M Dec
11	L	L	L	G	L	L	H	G	St	St	Inc	St	L	St	L	L	M	G	St	Inc	Dec	St	L	L Inc	L	St	L	St	L	L Dec

* Ranked by arrest rate category for 1966, 1970, and 1975, and progression to higher arrest rates.

housing scores, each for 1950, 1960, and 1970 with changes between these periods for each measure. Arrest rate and offense rate changes are also included for selected years. The cutting points utilized are in Appendix F.

The inner city tracts (Tracts 1, 3, 4, and 5) have similar arrest and offense rates, physical characteristics, and population characteristics. Although there are some anomalies, it is evident that the cycle of deterioration and movement out of inner city areas was followed by increasing delinquency and crime rates, in turn followed by further deterioration and departure of people and targets from the area.[4]

The next two groups (Early Transition to Higher Arrest Rates and Transition to Medium Arrest Rates) turned out to be a mixed bag with less consistency in the relationship of physical and population characteristics to arrest and offense rates. Tracts in the last group (Low Stable Arrest Rates) had numerous similarities but were not homogeneous. The circled characteristics on Table 2 may help communicate the kinds of relationships that have been found.

Tracts in Table 3 have been arranged in four groups according to their residential and land use characteristics. The inner city group remains the same but other tracts are shifted about. Tracts 2, 13, 6, and 7 almost surround the inner city group and are characterized by lower target densities, lower commercial-industrial use, lower residential vacancy rates, and better housing scores than those for tracts in the inner city.

TABLE 3. RELATIONSHIP OF TARGET DENSITY, LAND USE, VACANCY RATE, HOUSING TYPE, AND CHANGE TO ARRESTS AND OFFENSES KNOWN TO POLICE BY TRACTS*

	1950				1960				1950-1960 Change				Arrests by Residence		1970				1960-1970 Change				Arrests by Residence		Place of Offenses		Arrests by Residence		Place of Offenses	
	Target Density	% Comm/Ind	% Res Vacant	Housing Score	Target Density	% Comm/Ind	% Res Vacant	Housing Score	Target Density	% Comm/Ind	% Res Vacant	Housing Score	1966	Change 1966-69	Target Density	% Comm/Ind	% Res Vacant	Housing Score	Target Density	% Comm/Ind	% Res Vacant	Housing Score	1970	Change 1970-74	1970	Change 1970-74	1975	Change 1975-78	1975	Change 1975-78
Inner City																														
1	H	H	L	P	H	H	H	P	Inc	Dec	Inc	Det	H	H Inc	H	H	H	P	Dec	Dec	Dec	Det	H	H Dec	H	H Inc	H	H Dec	H	H Dec
3	H	H	L	P	H	H	H	P	Dec	St	Inc	St	H	M Inc	H	H	H	P	Dec	St	Inc	St	H	H Inc	H	H Inc	H	H Dec	H	L Dec
4	H	H	L	P	H	H	H	P	Dec	Inc	Inc	St	H	L Inc	H	H	H	P	Dec	Dec	Inc	St	H	L Inc	H	M Inc	H	H Dec	H	H Dec
5	H	H	L	P	H	H	M	P	Dec	Inc	Inc	Det	H	M Inc	H	H	H	P	St	Dec	Inc	St	H	M Inc	H	M Inc	H	H Dec	H	L Dec
Older or Transitional Areas																														
2	H	M	M	G	H	M	M	M	St	Inc	St	Det	M	M Inc	M	M	H	P	Dec	Dec	St	Det	M	M Inc	M	M Inc	H	M Dec	H	M Dec
13	H	M	L	M	H	M	M	M	Dec	St	St	Imp	L	L Inc	M	M	M	M	St	Inc	St	Det	L	L Inc	M	M Inc	M	L Dec	M	M Dec
6	M	L	M	M	M	L	M	M	St	St	Dec	St	L	L Dec	L	L	M	M	Dec	St	St	St	L	L Inc	M	L Inc	L	L Dec	M	M Dec
7	M	L	M	G	M	M	L	M	St	St	Dec	St	L	L Inc	L	M	M	M	St	Inc	St	Det	M	L Dec	M	St	M	L Dec	M	L Inc
Growing Areas																														
10	M	M	M	G	M	L	M	M	Dec	Dec	St	Det	L	L Inc	M	L	M	M	St	St	St	St	M	L Inc	M	L Inc	M	L Dec	M	L Dec
9	L	M	M	M	M	M	M	M	Inc	Dec	St	St	M	L Inc	M	M	M	M	Inc	Dec	Dec	St	M	L Inc	M	M Inc	M	L Dec	H	M Dec
12	M	H	L	M	L	M	H	M	St	Dec	Inc	Imp	L	L Inc	L	M	M	M	St	Dec	Dec	St	M	L Inc	M	M Inc	M	M Dec	H	M Dec
Consistently Better Areas																														
14	L	L	M	G	L	L	M	G	St	Inc	St	Imp	L	St	M	L	M	G	Inc	St	St	St	L	L Inc	L	L Inc	M	St	M	L Dec
11	L	L	L	G	L	L	H	G	St	St	Inc	St	L	St	L	L	M	G	St	Inc	Dec	St	L	L Inc	L	St	L	St	L	L Dec
8	L	L	H	G	L	L	L	G	Inc	Inc	Dec	St	M	M Inc	M	L	M	M	Inc	St	St	Det	H	M Inc	L	L Inc	H	M Dec	L	L Dec

*Ranked to achieve maximum homogenity of groups on all characteristics

Note that this group and the next one consisting of Tracts 10, 9, and 12 have many similarities. Yet, while their arrest rates were lower than those of the inner city tracts, most increased from 1966 to 1969 and some continued to increase from 1970 to 1974, although only one reached as high a level as the inner city rates before the decline which took place between 1975 and 1978.

The last group contains those very fine residential areas on the periphery of the city. They, as the inner city areas, are similar in many respects but do not have similar arrest or offense rates. Here, too, some of the similarities in characteristics within groups have been indicated on the table.

What is most apparent, however, is that even with tracts organized into somewhat similar groupings there are several patterns of arrest and offense rates and changes in rates within each group outside of the inner city. So, no matter which way the data are organized, a nice, orderly progression fails to materialize. But does it ever do so when the statistics are based on large, heterogeneous areas? Nevertheless, these tables do suggest that the analysis has moved along in such a manner as to capture the operation of the process of deterioration, decline, and increasing delinquency and crime, followed by further decline, the historic process which we have sought to document.

Unfortunately, the Southside Revitalization area in Racine, an area targeted for extensive community action (commencing in 1970 and involving local groups in the planning process) encompasses the lower half of Tracts 2 and 3 so that its impact on delinquency and crime cannot be measured in terms of tract changes.[5] Fortunately, the Revitalization area is contained within Police Grid Area 16 and is made up of five different neighborhoods so that the impact of this program, if any, can be noted later.

Tables 4 and 5 have been organized for police grid areas with somewhat different results than for census tracts because several high rate areas, areas that are only part of much larger areas, are well separated from others by the grid lines, more precisely than by the boundaries of census tracts. Police Grid Area 6 is the best example. Its relatively small population and other characteristics which would not mark it as a high crime area have been overshadowed by the attraction of its recreational facilities which have generated a high rate of offenses. As the years went by, every inner city and interstitial area plus those outlying areas which would draw people to them for reasons that might eventuate in delinquent or criminal behavior had high offense rates. Only one of the police grid areas that had a high offense rate by 1975 had a low target density (that was Grid 6 which we have just mentioned), only one had a low percent commercial-industrial, only two had low residential vacancy, and only three of the group were characterized as having good housing. While the total pattern suggested heterogeneity, a close look indicates that the evolving pattern of areal characteristics is related to high in-area offense rates.

TABLE 4. RELATIONSHIP OF TARGET DENSITY, LAND USE, VACANCY RATES, HOUSING TYPE, AND CHANGE TO COMMITTED PART I OFFENSES BY POLICE GRID AREAS*

	1950				1960				1950-1960 Change				Place of Offenses		1970				1960-1970 Change				Place of Offenses			
	Target Density	% Comm/Ind	% Res Vacant	Housing Score	Target Density	% Comm/Ind	% Res Vacant	Housing Score	Target Density	% Comm/Ind	% Res Vacant	Housing Score	1968	Change 1968-70	Target Density	% Comm/Ind	% Res Vacant	Housing Score	Target Density	% Comm/Ind	% Res Vacant	Housing Score	1970	Change 1970-74	1975	Change 1975-79
High Offense Rates																										
8	H	M	L	P	H	M	M	P	Dec	St	St	St	H	St	H	M	H	P	Dec	Inc	Inc	St	H	H Inc	H	H Dec
12	H	H	M	P	H	H	H	P	Inc	Inc	Inc	Det	H	M Inc	H	H	H	P	Dec	Dec	St	St	H	H Inc	H	L Dec
22	M	M	L	M	M	L	H	M	Inc	Inc	Inc	Imp	H	L Dec	H	M	M	M	Inc	Dec	Dec	St	H	H Inc	H	M Dec
6	-	-	-	-	L	H	M	G	-	Inc	Inc	Imp	H	St	L	H	L	G	-	Dec	Dec	St	H	H Inc	H	H Dec
Changed to High Rates																										
13	H	M	M	P	H	M	M	P	St	St	St	Det	M	M Inc	M	M	H	P	Dec	Dec	Inc	St	H	M Inc	H	L Dec
16	H	H	M	M	H	H	M	P	Dec	St	St	Det	M	M Inc	H	H	H	P	Dec	Inc	Inc	St	H	M Inc	H	M Dec
17	H	M	L	M	H	H	M	M	St	Dec	St	Det	M	M Inc	H	M	H	P	Dec	Inc	St	Det	H	M Inc	H	L Dec
15	-	-	-	-	L	L	M	G	-	Dec	Inc	Imp	M	M Inc	H	L	M	G	Inc	St	Dec	Det	H	St	H	L Dec
Recent Change to High																										
9	H	H	L	P	M	M	M	M	Dec	Inc	St	St	M	L Inc	M	M	M	P	St	St	St	St	M	H Inc	H	M Dec
5	M	M	L	M	M	M	H	M	St	St	Inc	Imp	M	M Inc	M	M	M	M	Inc	Inc	Dec	Det	M	L Inc	H	L Dec
19	-	-	-	-	L	M	-	-	-	Inc	-	-	L	L Inc	M	M	L	G	Inc	Inc	St	Imp	L	H Inc	H	M Dec
Medium Offense Rates																										
1	H	M	-	-	L	L	H	G	-	Dec	Inc	Imp	M	L Dec	L	L	L	G	Inc	Dec	Dec	St	M	M Inc	M	L Dec
14	M	L	L	G	M	L	M	G	St	St	St	St	L	M Inc	M	L	M	G	Inc	St	St	Det	M	L Dec	M	St
18	M	M	M	M	M	M	M	M	St	Dec	Dec	Det	L	L Inc	M	L	M	M	St	Inc	St	St	M	L Inc	M	L Dec
Recent Change to Medium																										
4	L	L	M	G	L	L	L	G	St	St	Dec	St	L	St	L	L	L	G	St	St	Dec	Det	L	L Inc	M	L Dec
2	H	L	-	-	M	M	H	G	-	Dec	Inc	Imp	L	L Inc	H	L	M	G	Inc	Inc	Dec	Det	L	L Inc	M	M Dec
20	M	L	-	-	M	L	-	-	Inc	Inc	-	-	L	L Dec	H	L	-	-	Inc	St	-	-	L	L Dec	M	H Dec
Low Offense Rates																										
21	L	L	H	G	L	L	L	G	St	St	Dec	St	L	L Inc	L	L	L	M	St	St	St	Det	M	L Dec	L	L Dec
10	L	L	L	-	L	L	H	G	-	Inc	Inc	Imp	L	L Inc	L	L	L	G	-	St	Dec	St	L	St	L	St
23	-	-	-	-	-	-	-	-	-	-	-	-	L	St	L	-	M	G	-	-	Inc	Imp	L	L Inc	L	M Inc

* Ranked by offense rate category for 1968, 1970, and 1975, and progression to higher offense rates.

TABLE 5. RELATIONSHIP OF TARGET DENSITY, LAND USE, VACANCY RATES, HOUSING TYPE, AND CHANGE TO COMMITTED PART I OFFENSES BY POLICE GRID AREAS*

	1950				1960				1950-1960 Change				Place of Offenses		1970				1960-1970 Change				Place of Offenses			
	Target Density	% Comm-Ind	% Res Vacant	Housing Score	Target Density	% Comm-Ind	% Res Vacant	Housing Score	Target Density	% Comm-Ind	% Res Vacant	Housing Score	1968	Change 1968-70	Target Density	% Comm-Ind	% Res Vacant	Housing Score	Target Density	% Comm-Ind	% Res Vacant	Housing Score	1970	Change 1970-74	1975	Change 1975-79
High Target Inner City																										
8	H	M	L	P	H	M	M	P	Dec	St	St	St	H	St	H	M	H	P	Dec	Inc	Inc	St	H	H Inc	H	H Dec
12	H	H	M	P	H	H	H	P	Inc	Inc	Inc	Det	H	M Inc	H	H	H	P	Dec	Dec	St	St	H	H Inc	H	L Dec
13	H	M	M	P	H	M	M	P	St	St	St	Det	M	M Inc	M	M	H	P	Dec	Dec	Inc	St	H	M Inc	H	L Dec
16	H	H	M	M	H	H	M	P	Dec	St	St	Det	M	M Inc	H	H	H	P	Dec	Inc	Inc	St	H	M Inc	H	M Dec
Partially Transition																										
9	H	H	L	P	M	M	M	M	Dec	Inc	St	St	M	L Inc	M	M	M	P	St	St	St	St	M	H Inc	H	M Dec
17	H	M	L	M	H	H	M	M	St	Dec	St	Det	M	M Inc	H	M	H	P	Dec	Inc	St	Det	H	M Inc	H	L Dec
Stable																										
14	M	L	L	G	M	L	M	G	St	St	St	St	L	M Inc	M	L	M	G	Inc	St	St	Det	M	L Dec	M	St
21	L	L	H	G	L	L	L	G	St	St	Dec	St	L	L Inc	L	L	L	M	St	St	St	Det	M	L Dec	L	L Dec
4	L	L	M	G	L	L	L	G	St	St	Dec	St	L	St	L	L	L	G	St	St	Dec	Det	L	L Inc	M	L Dec
18	M	M	M	M	M	M	M	M	St	Dec	Dec	Det	L	L Inc	M	L	M	M	St	Inc	St	St	M	L Inc	M	M Dec
Peripheral Residential Areas																										
6	-	-	-	-	L	H	M	G	-	Inc	Inc	Imp	H	St	L	H	L	G	-	Dec	Dec	St	H	H Inc	H	H Dec
19	-	-	-	-	L	M	-	-	-	Inc	-	-	L	L Inc	M	M	L	G	Inc	Inc	St	Imp	L	H Inc	H	L Dec
15	-	-	-	-	L	L	M	G	-	Dec	Inc	Imp	M	M Inc	H	L	M	G	Inc	St	Dec	Det	H	St	H	L Dec
5	M	M	L	M	M	M	H	M	St	St	Inc	Imp	M	M Inc	M	M	M	M	Inc	Inc	Dec	Det	M	L Inc	H	L Dec
20	M	L	-	-	M	L	-	-	Inc	Inc	-	-	L	L Dec	H	L	-	-	Inc	St	-	-	L	L Dec	M	H Dec
22	M	M	L	M	M	L	H	M	Inc	Inc	Inc	Imp	H	L Dec	H	M	M	M	Inc	Dec	Dec	St	H	H Inc	H	M Dec
23	-	-	-	-	-	-	-	-	-	-	-	-	L	St	L	-	M	G	-	-	Inc	Imp	L	L Inc	L	M Inc
Highest SES Areas																										
10	L	L	L	-	L	L	H	G	-	Inc	Inc	Imp	L	L Inc	L	L	L	G	-	St	Dec	St	L	St	L	St
2	H	L	-	-	M	M	H	G	-	Dec	Inc	Imp	L	L Inc	H	L	M	G	Inc	Inc	Dec	Det	L	L Inc	M	M Dec
1	H	M	-	-	L	L	H	G	-	Dec	Inc	Imp	M	L Dec	L	L	L	G	Inc	Dec	Dec	St	M	M Inc	M	L Dec

*Ranked to achieve maximum homogeneity of groups on all characteristics.

Table 5 parallels Table 3 and presents the data as if characteristics of areas were the most powerful determinants of in-area offense rates, even though, as we have said, the automobile gives people a degree of mobility that they did not have in the olden times, when the hansom cab was the mobile boudoir of the trysting genteel, but not as available to youth as is the product of Ford's imagination to the young rascal of today.

Note that the characteristics of the inner city areas are quite similar but that, while these and the transitional areas eventually have high in-area offense rates, there are other areas with quite different characteristics which also have high offense rates, as was pointed out in the previous table.[6] Perusal of this table leads one to the conclusion that superficially similar areas do not have identical crime problems even though it appears that combinations of variables may identify a milieu in which delinquency and crime are generated by either the residents or by those who are attracted to the area with the same certainty that a cow gives milk rather than martinis. With that non-scriptural intonation we turn to the world of quantitative analysis of the same metric data.

FOOTNOTES

[1] Dr. Carolyn Rebecca Block, Senior Analyst, Statistical Analysis Center, Illinois Law Enforcement Commission, constructed numerous graphs which assisted us in determining whether data were best represented by a single or two-segment slope. Her extensive correspondence on this problem was invaluable.

[2] The reader who wishes to investigate the very extensive literature on the ecology of urban areas would find Brian J.L. Berry and John D. Kasarda, Contemporary Urban Ecology, New York: Macmillan Publishing Co., 1977, the most comprehensive recent volume on this subject. For a more specialized contribution which describes the development of theory and research specific to the ecology of delinquency and crime, see Vijayan Kumara Pillai, "Ecology of Intra-Urban Delinquency and Crime," Journal of Environmental Systems, Vol. 11, 1981-82, pp. 101-111.

[3] Stanley Milgram, in "The Experience of Living in Cities," Science, Vol. 167, March 1970, pp. 1461-1468, argues that a psychological map or, even more precisely, a cognitive map of the city could be constructed.

[4] An analysis of data for the 32 largest U.S. cities for the period 1946-1970 suggests that White migration out of the central cities has led to social changes generative of high rates of delinquency and crime. See Wesley G. Skogman, "The Changing Distribution of Big-City Crime: A Multi-City Time-Series Analysis," Urban Affairs Quarterly, Vol. 13, September 1977, pp. 33-48.

[5] The Southside Revitalization Plan for Racine has been described in detail in Southside Revitalization Study: Development Plan for a Neighborhood of Racine, Wisconsin, Citizens Advisory Committee and Llewellyn-Davies Asociates, Racine, 1970.

[6] The four variables selected for inclusion as representative of the characteristics of areas were available for blocks for all time periods. Other variables from the long list of characteristics of blocks or areas would have probably added little to the findings, only making the task of describing the relationships more difficult. It must also be remembered that, with the exception of percent residential vacancy, each of the other variables was a composite score of several other measures.

Chapter 5. Dynamic Aspects of the Changing Spatial Distribution of Delinquency and Crime

THE MEASUREMENT PROBLEM

We have seen that while the process of decline and deterioration in the inner city has been followed by delinquency and crime rates higher than those found for the city as a whole, evidence of disproportional increases in offenses and arrests are also found in census tracts and grids far removed from the inner city. While these outlying areas differ from the inner city, they are similar in that they too function as arenas for trouble.

To be more specific, one may refer to taverns, parks and recreational areas, schoolyards, and beaches as arenas for delinquency and crime, yet each provides a somewhat different type of arena and there will be variation in types of offenses and in the ages of offenders from one arena to the other. The reader may interject that tavern disturbances and stolen beach balls are not what we are concerned about, that the crimes about which we should be concerned are burglary, armed robbery, aggravated assault, and murder. Most of the offenses which take place in these arenas are not in the more serious categories, but these arenas do produce every type of offense from juvenile status offenses to the most gruesome murders. Thus, in order to conduct a statistical analysis, it is desirable to include all Part I Offenses regardless of the level of seriousness and all arrests, whatever the reason for the arrest may be.

When the cohort data are analyzed statistically, all police contacts are included, regardless of seriousness. Similarly, most targets are included, service stations, liquor stores, grocery stores, restaurants, and taverns. There is always the possibility that findings will differ depending on the operational definitions of concepts or variables; e.g., targets have probably been defined too broadly for some persons and too narrowly for others. We shall later take a closer look at the relationship of the tavern to the spatial and temporal distribution of offenses and arrests.

Unless careful consideration is given to the selection of appropriate analytic procedures and statistical techniques the results may be an artifact of the method and no more accurate, perhaps less accurate, than conclusions based on examination of the tables that have been presented in previous chapters. The reader may wish to turn to Appendix G for a detailed exposition of how we have fully explored the problems of skewness, heteroscedasticity, and non-linearity. Our concern with assessment of the results from different statistical techniques parallels our continual concern over the possibility that differences in the characteristics of spatial systems will influence the results.

THE IMPACT OF CENSUS TRACT CHARACTERISTICS ON ARREST AND OFFENSE RATES IN TRACTS

In this section we make our first attempt to discern the extent to which arrest and offense rates and changes in them are a function of the characteristics and changing characteristics of spatial units, i.e., dynamic aspects of the ecology of the city.

The R^2 for each correlation is presented in Table 1 as an index of the amount of variance in arrest rates accounted for by each tract characterisic. We commence with arrest rates for Part I and II Offenses by place of residence in 1966 and 1969, and change between those years. Note that whether the tract characteristic measure was for 1950 or 1960 and the arrest rate was for 1966 or 1969, target density and housing quality scores accounted for more variance than the other variables. In other words, low SES of residents, as represented by poor quality housing and a high incidence of targets, were the two most powerful "determinants" of the arrest rates of residents of census tracts. Since the causal nexus is very problematic when ecological correlations are the evidence, it would be better to say that they are the two most powerful predictors.

Although one could expect the relationships for 1960 to be greater than those for 1950, this was not the case for percent of the occupied units with Black residents. There was an actual reduction of the R^2 value between 10-year periods. This was also the only 1960 variable in which the relationship between it and arrest rate was not significant at the .05 level. Although the percent of the housing that was occupied by Blacks had a somewhat lower correlation with housing quality in 1950 than in 1960 and 1970, as we have suggested before, race/ethnicity was essentially the same indicator of status during one time period as another,

TABLE 1. RELATIONSHIP OF TARGET DENSITY, LAND USE, RESIDENTIAL VACANCY, HOUSING TYPE, AND PERCENT BLACK TO ARRESTS AND OFFENSES KNOWN TO POLICE BY CENSUS TRACTS

	Dependent Variable = Arrest Rates, Place of Residence						Dep. Var. = Tract Change 1960-70	Dep. Var. = Tract Characteristics 1970	
	1966		1969		Change 1966-69		Ind. Var. = Arrest Rate	Ind. Var. = Arrest Rates	
Ind. Variables	1950	1960	1950	1960	1950-60	1960-70	Change 1966-69	1966	1969
Target Density	.75*	.77	.72	.76	.00	.00	.73	.80	.80
% Comm.-Ind.	.28	.64	.27	.61	.00	.00	.23	.64	.61
Res. vs. Mfg.	.00	.40	.00	.38	.04	.46	.44	.32	.25
% Res. Vacancy	.00	.28	.00	.27	.01	.00	.00	.75	.70
Housing Score	.71	.85	.65	.79	.00	.13	.05	.81	.80
% Occ. Unit Black	.39	.20	.37	.21	.00	.20	.00	.38	.32

	Dependent Variable = Arrest Rates, Place of Residence					Dep. Var. = Arrest Rates, Place of Residence				
	1970		1974		Change 1970-74	1975		1978		Change 1975-78
Ind. Variables	1960	1970	1960	1970	1960-70	1960	1970	1960	1970	1960-70
Target Density	.78	.81	.60	.75	.07	.74	.78	.75	.80	.67
% Comm.-Ind.	.64	.64	.60	.58	.06	.70	.69	.64	.66	.76
Res. vs. Mfg.	.35	.24	.25	.16	.00	.36	.28	.29	.22	.68
% Res. Vacancy	.28	.70	.25	.72	.06	.31	.84	.34	.87	.67
Housing Score	.81	.79	.75	.73	.01	.83	.82	.77	.75	.68
% Occ. Units Black	.15	.28	.17	.31	.01	.28	.45	.20	.43	.83

	Dependent Variable = Place of Offense					Dep. Var. = Place of Offense				
	1970		1974		Change 1970-74	1975		1978		Change 1975-78
Ind. Variables	1960	1970	1960	1970	1960-70	1960	1970	1960	1970	1960-70
Target Density	.91	.68	.91	.69	.41	.89	.68	.88	.66	.00
% Comm.-Ind.	.72	.75	.77	.77	.48	.78	.77	.77	.78	.00
Res. vs. Mfg.	.17	.11	.12	.08	.36	.14	.10	.13	.09	.00
% Res. Vacancy	.47	.46	.47	.49	.35	.48	.49	.45	.51	.00
Housing Score	.74	.77	.74	.76	.35	.73	.76	.73	.76	.00
% Occc. Units Black	.06	.12	.07	.13	.34	.10	.15	.06	.14	.16

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* R^2 = Proportion of variance explained by the independent variable.

rather than an explanatory variable. As Blacks became more spatially segregated and high offense and arrest rate areas developed outside the inner city the correlation between arrest and offense rates and percent of residential units occupied by Blacks declined. What we can say must be said with caution, however, because the small number of census tracts permits considerable chance fluctuation from year to year or time period to time period.

The next set of R^2s represents the relationship between change from 1966 to 1969 in arrest rates and change in the characteristics of census tracts between 1950 and 1960 and between 1960 and 1970. There was little or no impact of change in tracts on change in arrest rates; only one correlation was significant and that was for percent residential vs. manufacturing. It appears that the basic arrest rate in tracts follows from the characteristics of tracts and that changes in rates (with one exception) are unrelated to change in the characteristics of tracts. In other words, there does not appear to be a change in impact beyond those characteristics of the area itself (with the exception of the impact of change in the percent of primary land use from residential housing to manufacturing on the logarithm of arrest rate change with earlier arrest rate held constant). However, when tract characteristics are the dependent variable, change in target density, change in percent commercial-industrial, and change in percent residential vs. manufacturing appear to be accounted for in part by change in arrest rate.

Since the change period covered for arrest rates is only four years and that for tract change is 10 years, we must be cautious. It would have been more desirable to see if tract change 1970 to 1980 followed arrest rate change 1966 to 1969. But it is apparent that essentially synchronous change was taking place in tracts.

The next two sets of columns are comparable to the first four sets because there are no change variables. We have made arrest rates the independent variables to see if they are more closely followed by tract characteristics than were arrest rates followed by tract characteristics in the earlier period. Arrest rates account for as much or more of the tract characteristics in 1970 as did 1960 tract characteristics account for 1969 arrest rates. The problem of differences between the 1966 and 1969 rates is not sufficient to be of concern but since rates did vary from year to year some variation of the order found would be expected.

What these columns do show is a continuing relationship between the characteristics of tracts and their arrest rates. The R^2s on the opposite side of the page and the next group down are for arrest rates for 1970 and 1974 and change in arrest rates 1970 to 1974 and tract characteristics for 1960 and 1970 and tract change 1960 to 1970, a set of relationships more or less comparable to the ones directly above them. The major difference is that all of the tract characteristics now have some relationship to arrest rates in 1970 and 1974.[1] But again there is little evidence in the next column of a dynamic kind of relationship, an impact of change in the characteristics of areas on change in arrest rates, arrest rate in 1970 held constant. One finding that should be noted is that 1970 residential vacancy and percent of occupied units occupied by Blacks were more highly correlated with 1970 and 1974 arrest rates than were 1960 vacancies and Black residents. The same relationships, although with even higher correlations, were found for the 1960 and 1970 tract characteristics and with 1975 and 1978 arrest rates. This represents a far greater difference between 10-year intervals in tract characteristics for the residential vacancy correlations and a difference in direction for the percent of occupied dwelling units that were occupied by Blacks. Taken together, these changing relationships suggest the "hardening" of the inner city phenomenon, one to which reference will be made more frequently as findings are more fully developed and interpreted.

Although tests or propositions are not conducted by example, several examples may help to clarify the complexity of the findings. Census Tract 1 had by far the greatest increase in arrest rates of any tract between 1966 and 1969 and also had the greatest decline in target density between 1960 and 1970. Tract 3 ranked second on both variables. Tract 14, which ranked 13th on change on both variables, had only a medium target density in 1960 and an increase to 1970, while it had a low arrest rate which rose relatively less. There were other combinations of increases and decreases in tract characteristics and increases in arrest rates from different initial positions so that in most cases change in tracts had little impact on changes in arrest rates. Similarly, when arrest rate changes between 1970 and 1974 were considered, there was little impact of change itself on arrest rates. The relationship of tract characteristics to arrest rates is clearly present here, but the more dynamic aspect that we expected has not yet been encountered, at least for arrest rates. Characteristics of tracts appear to be powerful determinants of arrest rates but the variables that we have employed as indicators of change in the social organization of the community add little impetus to arrest rate change beyond the basic characteristics that they represent.

Another way to describe it would be to say that the characteristics of an area help explain its arrest rate but that change in these characteristics is not such an additionally powerful determinant that it correlates with immediate change independent of the arrest rate at the time that the arrest rate commences to change.

The next four sets of columns show an increase in R^2 for almost every tract characteristic for 1975 and 1978 over those shown for 1970 and 1974. The correlations for change in tract characteristics 1960 to 1970 and change in arrest rates are very high because the large downturns in arrest rates commencing in 1975 were for inner city and interstitial areas whose characteristics consistently differentiate them from other areas of the community. Although these relatively high R^2s appear to be an anomaly in comparison with the other sets of findings, they are the result of declines in inner city arrest rates which took place at the same time that other characteristics of inner city tracts were changing, thus producing a relationship of change to change that did not appear in the first sets of change columns. The inner city tracts continued to have the highest arrest rates and underlying criminogenic conditions. The reader must also remember that we are discussing arrest rates for residents of tracts, a different matter from offenses in tracts, to which we now turn.

The lowest set of columns in Table 1 covers fewer years and thus there are only two sets of tables, one for 1970 and 1974 and 1970 to 1974 change in offense rates and one for 1975 and 1978 and 1975 to 1978 change in offense rates. The columns in which the relationships between tract characteristics and in-tract offenses are shown are remarkably similar for each offense year, by year of tract characteristics.

Target density, percent commercial-industrial, and housing quality scores consistently accounted for from two-thirds to three-quarters or more of the variance in offense rates in tracts. While change in tract characteristics accounted for a sizeable amount of the change in offense rates within tracts with offense rates held constant at the beginning of the change period, this is inconsistent with the parallel analysis for arrest rates. But, arrest rates did not follow the same pattern of change between 1970 and 1974 as did offense rates. Also, offense and arrest rates followed somewhat different patterns of change between 1975 and 1978. Tract 1, for example, had a decline in arrest rates between 1970 and 1974 and 1975 and 1978 but, while it had an increase in offense rates within the area between 1970 and 1974, it had the greatest decrease in offense rates between 1975 and 1978. It still had the highest arrest and offense rates. Added to this is the fact that offense rate changes were larger than arrest rate changes in 1970 to 1974 but much smaller proportionately in the 1975 to 1978 period. Again, the downward turn in offense as well as arrest rates makes the 1975 to 1978 change analysis more or less irrelevant to the basic hypothesis, but it must be included if all of the data are to be presented.

The crux of the findings is that there has been a developing relationship between the characteristics of census tracts and offense and arrest rates. Each year the characteristics of tracts account for much of the variation in tract offense and arrest rates. Contrary to expectations, however, controlling for position at the start of change, and only considering that which was disproportional to the position of a tract at the start of a change period, added little further to "explaining" differences in arrest rates between two points in time.

THE IMPACT OF POLICE GRID AREA CHARACTERISTICS ON OFFENSE RATES

Whatever the findings with census tracts as the units of a spatial system, our next concern is with the extent to which findings utilizing police grid areas will duplicate place of offense relationships for census tracts (Table 2). Here again there is the problem of a small number of grids but it is our position that these analyses have value because they enable us to describe the strength of the relationships between offense and arrest rates and characteristics of areas considerably better than was possible with the tables presented in the previous chapter.

The first set of columns of R^2s is for 1968 and is very similar to the R^2s for 1970, the first year for which data were presented for tracts. Note the difference between the R^2s for place of offense rates for 1970 and characteristics for 1960 and 1970 for police grid areas and the R^2s for census tracts. They are almost two completely different sets of correlations and there is a more dynamic aspect to change in the independent variables and change in offense rates. When offense rates in 1968 and 1970 became the independent variables and grid characteristics the dependent variables the R^2s were also considerably different from those for census tracts. The findings vary with the spatial system utilized. No wonder those who are engaged in research of this nature debate with fervor which unit of analysis should be used, particularly if there are relatively few units in each spatial system and there is considerable heterogeneity within the units of each system. Our position has been that a variety of spatial systems must be used with the same basic data in order to find out exactly how the findings differ. Conflicting claims may be settled if it is

TABLE 2. RELATIONSHIP OF TARGET DENSITY, LAND USE, RESIDENTIAL VACANCY, HOUSING TYPE, AND PERCENT BLACK TO OFFENSES KNOWN TO POLICE BY POLICE GRID AREAS

	Dependent Variable = Rate by Place of Offense							Dependent Variable = Grid Characteristics		
	1968		1970			Change 1968-1970		1970		Change 1960-70
								Ind. Variable: Offense Rate		Ind. Variable Offense Change
Independent Variables	1950	1960	1950	1960	1970	1950-60	1960-70	1968	1970	1968-1970
Target Density	.12*	.36	.07	.34	.20	.10	.05	.21	.20	.39
% Comm.-Ind.	.65	.29	.63	.38	.56	.04	.06	.48	.56	.11
Resid. vs. Mfg.	.09	.34	.02	.42	.47	.29	.04	.39	.47	.03
% Resid. Vacancy	.00	.00	.00	.00	.20	.38	.21	.14	.20	.32
Housing Score	.71	.39	.74	.46	.49	.19	.12	.40	.49	.00
% Occup. Units Black	.35	.24	.54	.32	.07	.13	.31	.11	.07	.13

	Dependent Variable = Rate by Place of Offense			Dependent Variable = Rate by Place of Offense				
	1974		Change 1970-74	1975		1979		Change 1975-79
Independent Variables	1960	1970	1960-70	1960	1970	1960	1970	1960-70
Target Density	.21	.08	.00	.21	.19	.31	.16	.24
% Comm.-Ind.	.66	.84	.00	.60	.78	.65	.83	.12
Resid. vs. Mfg.	.57	.51	.00	.44	.48	.58	.55	.28
% Resid. Vacancy	.00	.09	.19	.00	.01	.00	.16	.28
Housing Score	.42	.39	.19	.31	.33	.43	.41	.22
% Occup. Units Black	.27	.04	.00	.18	.13	.32	.10	.30

---

* R^2 = Proportion of variance explained by the independent variable.

demonstrated that the heterogeneity that seems to characterize larger units is behind the conflicting findings of research in the same and different communities.

The two sets of R^2s for place of offense in 1974 may be compared with those in Table 1 for the same years but again there is no similarity between the tract and grid data. And, while there was evidence of a dynamic aspect in change for the tract data in 1970 to 1974, there was less for the grid data for these years.

The next set of relationships for grid areas was no more comparable to tracts than were others. One must conclude that the findings differ when tract and grid comparisons are made. However, since even the offenses in tracts and grids differed somewhat because of compilation procedures, we shall hold a final conclusion on this matter in abeyance until the cohort data on delinquency and crime have been compared with the characteristics of areas in each of the four spatial systems. When exactly the same independent and dependent variables have been utilized with different spatial systems with the same results we may be sure that the findings are not an artifact of the spatial system. Before turning to the cohort data we must turn back to targets and, more specifically, to taverns.[2] In the course of this we shall obtain a better understanding of how such different results were obtained for tract and grid data.

TARGET DENSITY, TAVERNS, VACANT HOUSING, AND RATES AND TRENDS IN TRACTS AND GRIDS

The relationship of target density to vacant housing and trends for both and their relationship to Part I Offense rates in police grid areas are shown in the first few columns of Table 3. Grid areas are placed in three groups according to target density and the trend for target density. Each grid area had originally or by 1970 acquired a relatively high percent of vacant housing and all had a high or medium and increasing in-area offense rate. What reduces the correlations just presented in Table 2 is the heterogeneity of the medium target density group which includes areas in which target density is increasing, decreasing, and stable, in which vacant housing trends are of all kinds, and in which there is also an assortment of offense levels and trends, although most of the latter are increasing. But note that the first six grid areas are the inner city and interstitial areas and that all have high tavern densities.

With the risk of oversimplifying, a map of areas of tavern concentration is included at this point. A special report made available to us revealed that almost every area shown on this map includes taverns which are considered by the police or by other persons in official positions as "trouble taverns." At the same time these taverns are considered by persons who frequent them as places for rewarding interaction with their friends and associates. Changes in the distribution of taverns are shown on Maps 2, 3, and 4, changes which are related to the changing spatial distribution of police contacts in Racine.

TABLE 3., RELATIONSHIP OF TARGET DENSITY AND CHANGE AND VACANT HOUSING AND CHANGE TO PART I OFFENSES COMMITTED IN POLICE GRID AREAS AND ARRESTS AND OFFENSES KNOWN TO POLICE BY CENSUS TRACTS

PART I OFFENSE RATE AND TREND BY POLICE GRID AREA

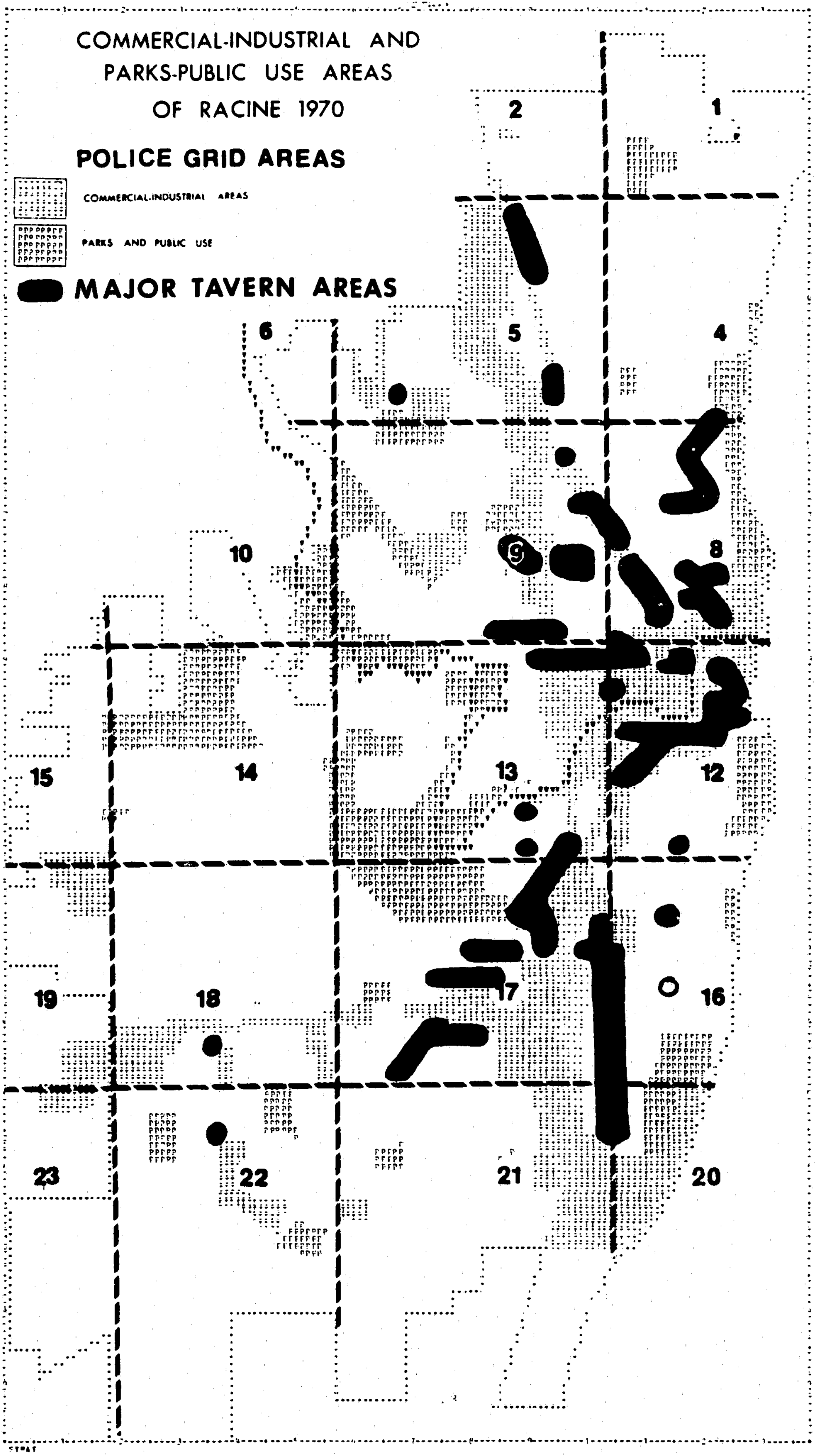
Target Density & Trend 1950-70		% Vacant Housing & Trend 1950-70	Offense Rate & Trend 1969-79	
High Target Density:				
Dec.	8	High Inc. to 5.59%	High	Inc.
	12	High Inc. to 8.30%	High	Inc.
	16	High Inc. to 7.83%	Med.	Inc.
	17	Med. Inc. to 4.09%	Med.	Inc.
(All have high tavern density.)				
Medium Target Density:				
Dec.	13	High Inc. to 5.92%	Med.	Inc.
	9	Med. Inc. to 3.89%	Med.	Inc.
Stbl.	14	Med. Inc. to 2.10%	Low	Stable
Inc.	5	Med. Dec. to 2.02%	Med.	Inc.
	22	Low Dec. to -2.0%	High	Inc.
	2	Low Dec. to -2.0%	Low	Stable
	15	Low Dec. to -2.0%	Med.	Inc.
	20	Too few blocks for trend	Low	Fluct.
(13, 9, and 20 have high tavern density.) (14, 15 and 2 have no taverns.)				
Low Target Density:				
Stbl.	6	Low Dec. to -2.0%	High	Inc.
	10	Low Dec. to -2.0%	Low	Stable
	4	Low -2.0%	Low	Stable
	18	Low -2.0%	Low	Inc.
	21	Low -2.0%	Low	Stable
	23	Med. 3.79%	Low	Inc.
	1	Low Dec. to -2.0%	Low	Inc.
Inc.	19	Low -2.0%	Med.	Inc.

ARREST RATE AND TREND FOR RESIDENTS OF AND OFFENSES IN CENSUS TRACTS

Target Density & Trend 1950-70		% Vacant Housing & Trend 1950-70	Arrest Rate for Part I and II Offenses and Trend 1966-78		Part I Offenses Committed Within Census Tracts & Trend 1970-78	
High Target Density:						
Dec.	1	High Inc. to 8.57%	High	Inc.	High	Inc.
	3	High Inc. to 11.47%	High	Inc.	High	Inc.
	4	High Inc. to 7.82%	High	Inc.	High	Inc.
Stbl.	5	High Inc. to 8.04%	High	Inc.	High	Inc.
(1,3,4, and 5 also have high tavern density.)						
Medium Target Density:						
Dec.	2	Med. Inc. to 4.25%	Med.	Inc.	Med.	Inc.
	13	Med. Inc. to 2.95%	Med.	Inc. (Fluct.)	Med.	Stable
Stbl.	10	Med. Inc. to 2.06%	Low	Inc.	Med.	Stable
Inc.	14	Med. Inc. to 2.95%	Low	Inc.	Low	Inc.
	8	Low -2.0%	Med.	Inc.	Low	Stable
	9	Low -2.0%	Med.	Inc.	Med.	Stable
(13 has med. tavern density, 10 has no taverns.)						
Low Target Density:						
Dec.	6	Low -2.0%	Low	Inc. (Fluct.)	Med.	Stable
	7	Low -2.0%	Low	Inc. (Fluct.)	Med.	Stable
Stbl.	11	Low -2.0%	Low	Stable	Low	Stable
	12	Low -2.0%	Low	Inc.	Med.	Inc.
(6 and 12 have low tavern density; 11 has no taverns.)						

(4,18 and 21 have low tavern density; 1 and 19 have no taverns, and 6, 10 and 23 have no targets.)

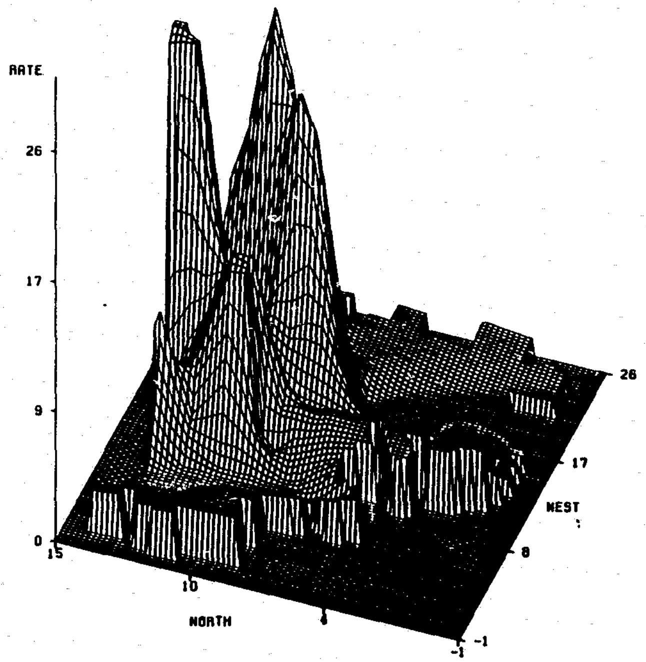
MAP 1


COMMERCIAL-INDUSTRIAL AND
PARKS-PUBLIC USE AREAS
OF RACINE 1970
POLICE GRID AREAS
COMMERCIAL-INDUSTRIAL AREAS
PARKS AND PUBLIC USE
MAJOR TAVERN AREAS
1
2
4
5
6
8
9
10
12
13
14
15
16
17
18
19
20
21
22
23

MAP 2

NUMBER OF TAVERNS

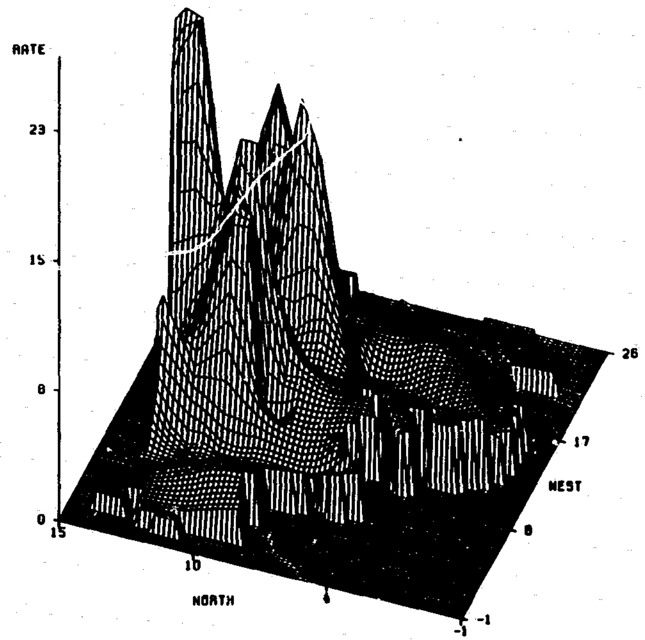
BY NEIGHBORHOOD: 1950



MAP 3

NUMBER OF TAVERNS

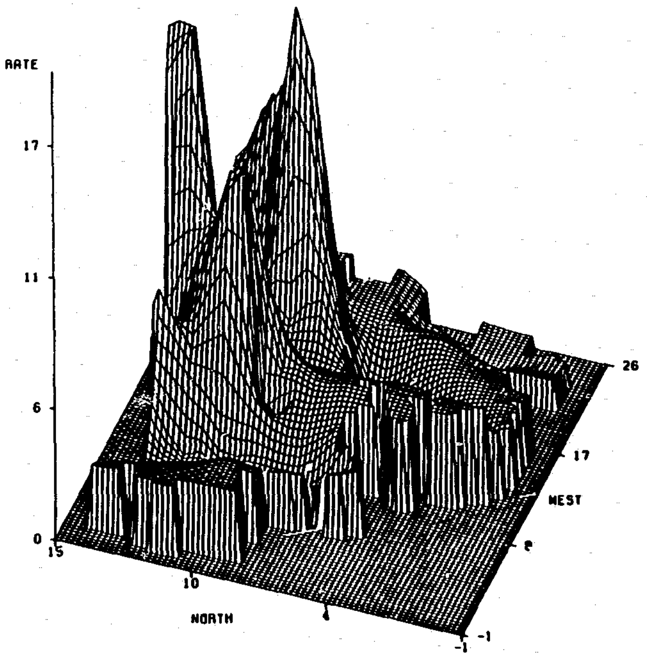
BY NEIGHBORHOOD: 1960



MAP 4

NUMBER OF TAVERNS

BY NEIGHBORHOOD: 1970



Only one of the low target density areas shown in Table 3 has a high and increasing offense rate and this is not really an anomaly because, as we have mentioned before, it has formal and informal recreational attractions that draw the youthful population at all times except in the winter.

In the second half of the table we find residential arrest rates and in-tract offense rates which follow a pattern similar to that of census tracts. These data also show that the inner city tracts are characterized in the same way and have had the arrest and offense trends which are of concern. Here again the middle group is heterogeneous but in this group with characteristics much like the inner city are also the interstitial Tracts 2 and 13. What one must conclude is that combinations of factors distinguish these high offense and arrest rate areas far better than do single factors.

The extent to which these combinations of factors account for rates could be shown by more sophisticated statistical techniques were it not for the fact that the number of cases (census tracts and police grid areas) is so small and the variables so highly interrelated that the results would be questionable and tell us no more than we know by the relatively simple techniques that have been utilized in this chapter.

FOOTNOTES

[1] Schuerman and Kobrin have attacked the problem of changing patterns of delinquency in Los Angeles by delineating enduring, transitional, and emerging delinquency areas, then explaining variance in delinquency rates and changes in rates with a multitude (83) of variables within each group of areas. Although they generated findings from analyses including all of their variables and then described those which made significant contributions, we selected a few variables which could be used with each spatial system. The general conclusion that precursors to the development of high delinquency areas vary from time period to time period is common to both research projects. See Leo A. Schuerman and Solomon Kobrin, "Ecological Processes in the Creation of Delinquency Areas: An Update." Presented at the 1981 Annual Meeting of the American Sociological Association, Toronto, Ontario, Canada, August 26, 1981.

[2] A recent paper which explores our concern about targets is one by Lawrence E. Cohen and Marcus Felson, "Social Change and Crime Rate Trends: A Routine Activity Approach," American Sociological Review, Vol. 44, August 1979, pp. 588-608. In concluding this article they state, "It is ironic that the very factors which increase the opportunity to enjoy the benefits of life also may increase the opportunity for predatory violations." They further point out that "...the opportunity for predatory crime appears to be enmeshed in the opportunity structure for legitimate activities to such an extent that it might be very

difficult to root out substantial amounts of crime without modifying much of our way of life."

Chapter 6. Cohort Delinquency and Crime Rates and the Ecological Structure of the City

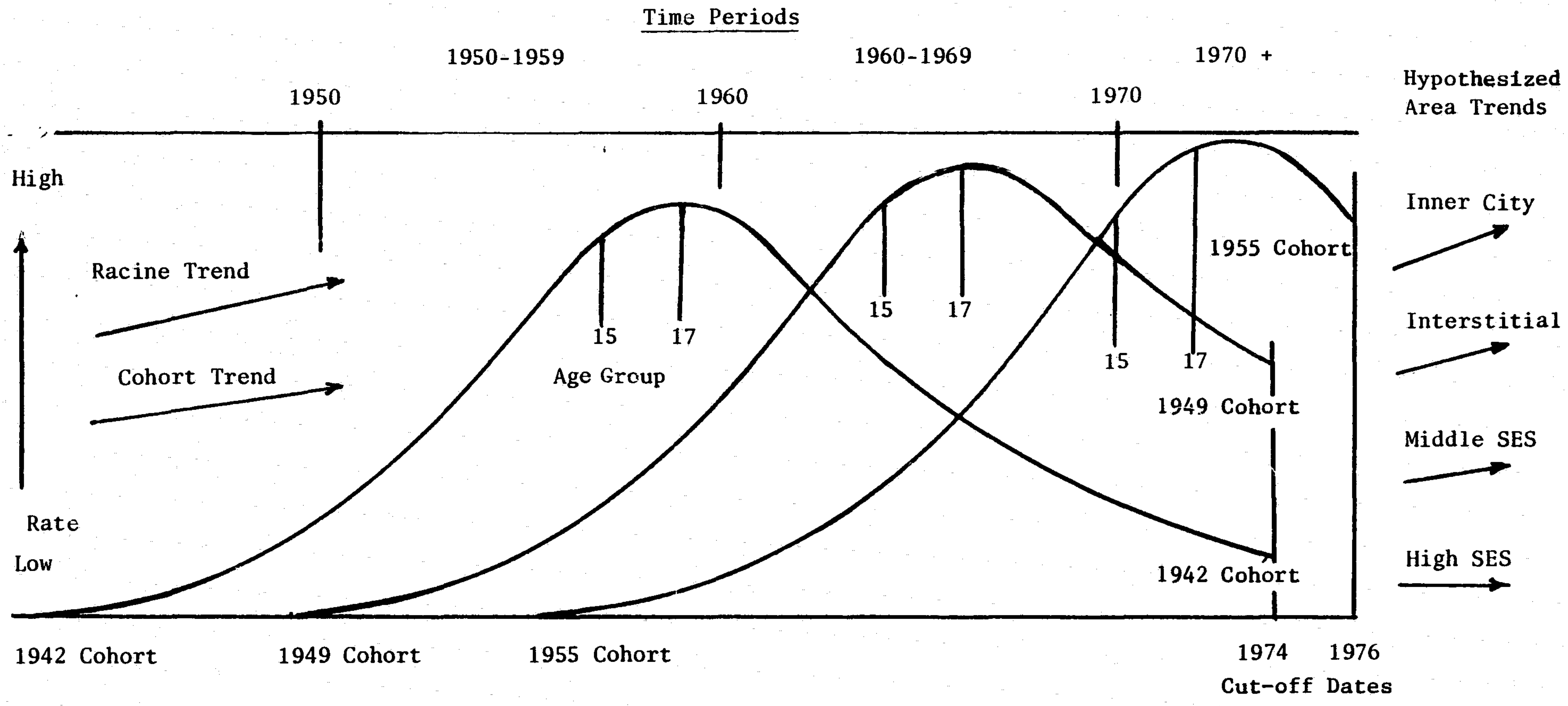
THE PROBLEM OF AGE GROUP, TIME PERIOD, COHORT, AND SPATIAL VARIATION

Acknowledging the importance of controlling for simultaneous variation in rates (age, period, and cohort) and being able to describe the product of these variations as they generate changing spatial patterns of delinquency and crime are two different things. Changing spatial patterns may be measured according to four different systems. Only the cohort data may be utilized for each spatial system. The reader who wishes to see differences from one spatial system to another as shown on maps should refer to Appendix H.

Each cohort may have a different police contact rate holding age of cohort member and other variables constant. Rates vary over time periods. Police contact and other rates vary with the age of persons in the cohort. And within each spatial system, rates vary according to the social characteristics of areas. The manner in which this problem has been approached may be illustrated by Diagram 1.

The basic question to be answered with the combined cohort data is whether or not there is spatial variation in police contact and other measures of delinquent and criminal activity over time following the general pattern of spatial variation that we have thus far found with the various data sets.

DIAGRAM 1. TYPES OF OFFENSE RATE VARIATION IN THREE RACINE COHORTS

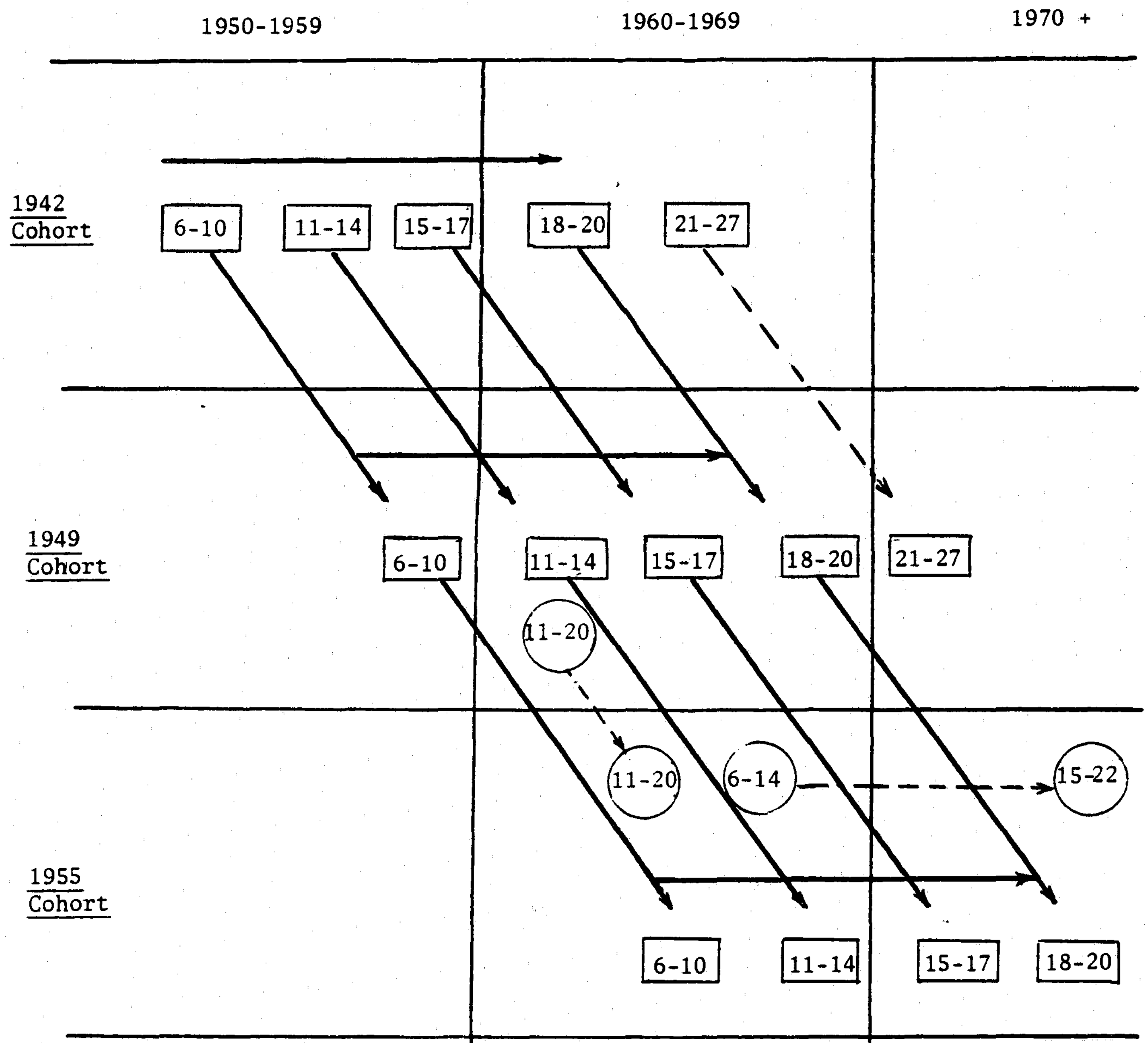


Turning to Diagram 1, note that there are four basic time periods for which we have the characteristics of each area for each spatial system. There is the period before 1950 which is probably, at least in the years close to 1950, what each area was like at that time; the cohort born in 1942 did not experience much of that period and the 1949 and 1955 Cohorts missed it. The 1950 through 1959 period becomes the first relevant period for the 1942 and 1949 Cohorts, and so on, with the 1960 through 1969 and 1970 and later periods relevant for all cohorts.

In order to examine the effect of place of residence on delinquent and criminal behavior and societal response to it with controls for age of cohort members, the age-by-age record of police contacts and cohort disposition have been aggregated in such a way that age groups do not overlap the 10-year time periods for which principal places of residence have been established. It is thus possible to measure cohort change within time periods for meaningful age categories as well as cohort change with age. Diagram 1 should facilitate comprehension of the limitations that are faced when selecting comparable age groups from each cohort as a basis for answering the questions addressed in this chapter.

Diagram 2 shows how the age-by-age data have been aggregated for analysis. Heavy solid lines show the age groups for which rates have been computed. Change between ages and cohorts have been measured for number of police contacts, seriousness of careers, number of referrals, and severity of sanctions. Several

DIAGRAM 2. AGGREGATION OF THE AGE-BY-AGE DATA SET FOR AGE, PERIOD, AND COHORT DIFFERENCE ANALYSIS



Cohort	Age Range 1950-59	Age Range 1960-69	Age Range 1970+
1942	6-17	18-27	28-34
1949	6-10	11-20	21-27
1955		6-14	15-22

other comparisons for which rates could be computed but which have not been included are shown by lighter dashed lines. Before becoming involved in the rather complex comparisons permitted by this arrangement we shall present a much simpler analysis without the age period controls.

The analyses which follow are a first step toward describing changing rates of delinquency and crime over the decades as produced by three birth cohorts. Since the relationships to be presented in this and following chapters will be less than perfect, we assume that individual differences in people would, if incorporated into the model, increase its explanatory power.

Exactly which measure of any given phenomenon is the best is always a question for debate. If the problem is one of prediction, then that measure of the independent variable which results in the best prediction of the dependent variable is the best measure as long as everyone is satisfied that the dependent variable has been appropriately measured. Since we are involved in the description of relationships and changing relationships and are not oriented toward maximizing predictive efficiency, several measures of each variable are presented in order to reveal how the findings vary with the measure of cohort delinquency and crime that is utilized.

TIME PERIOD VARIATION BY PLACE OF CONTACT

The simplest way to commence this phase of the analysis is to describe the location of police contacts by areas of each spatial system for the aggregated cohorts during the three major time periods, 1950 through 1959, 1960 through 1969, and 1970 and later. Although the tables which follow are based on aggregated cohorts, the same statistics were also examined for each cohort separately.

There are a number of ways in which to compute time period rates, population as the base being the most usual. There are arguments for using the number of blocks in the area but this eliminates the population density factor and opportunities related to density. If the possibility of transition in houshold burglary rates was our concern justification might be made for developing rates based on the number of residences in each area.[1] While there may be some question about whether the approach that we have settled upon is the best, it was decided that each area should be observed with two rate models in mind: 1) the census population in that area during each of the time periods and 2) the number of cohort members residing in the area during each of the time periods. Which of the two rates is used makes some difference. The proportion of cohort members in each area in the inner city and interstitial areas will be less than the proportion of the total population in these areas and the opposite will be the case for peripheral areas. Rates for the aggregated cohorts by time periods are shown in Tables 1 and 2.

In considering the rates presented in these tables it must be remembered that the 1950s rate includes persons from the 1942 Cohort ages 6 through 17 and that the 1949 Cohort persons included are ages 6 through 10. The 1960s rate includes those

TABLE 1. AGGREGATED IN-AREA COHORT POLICE CONTACT RATES BY TIME PERIODS FOR CENSUS TRACTS, POLICE GRID AREAS, AND NATURAL AREAS

	CENSUS TRACTS							POLICE GRID AREAS							NATURAL AREAS					
	1950's		1960's		1970's			1950's		1960's		1970's			1950's		1960's		1970's	
	Per 100[1] Pop. 1955	Per Cohort Resid.	Per 100[2] Pop. 1965	Per Cohort Resid.	Per 100 Pop. 1975	Per Cohort Resid.		Per 100 Pop. 1955	Per Cohort Resid.	Per 100 Pop. 1965	Per Cohort Resid.	Per 100 Pop. 1975	Per Cohort Resid.		Per 100 Pop. 1955	Per Cohort Resid.	Per 100 Pop. 1965	Per Cohort Resid.	Per 100 Pop. 1975	Per Cohort Resid.
Inner City																				
1	9.00	17.25	91.28	117.75	146.94	72.00	8	.82	.40	8.56	2.47	10.88	3.56	1	1.02	.59	7.54	3.05	13.48	5.61
3	1.07	.59	11.12	2.97	16.12	6.03	12	1.77	1.71	16.17	8.33	23.24	9.18	2	1.83	1.00	17.41	4.67	29.98	10.44
4	1.04	.52	10.10	3.02	12.87	5.01	13	1.05	.85	7.28	2.27	9.05	3.05	3	1.20	.81	7.91	3.09	9.02	3.44
5	.98	.58	7.95	2.67	12.95	5.07	16	.75	.44	7.33	2.21	9.34	3.45	4	.57	.28	8.98	2.43	14.42	3.14
														5	1.29	1.21	10.14	5.08	10.98	4.14
Transitional																				
2	.75	.66	6.37	3.02	8.79	3.34	9	.95	.43	5.60	1.45	8.74	2.42	6	.35	.17	5.07	1.33	5.64	2.17
13	.14	.30	5.30	1.79	7.17	2.23	20	5.20	.23	10.47	.63	4.01	.54	7	--	--	--	--	6.85	.92
6	1.45	.84	5.67	1.59	6.98	1.67	17	1.45	.91	7.26	2.24	10.58	3.22	8	.37	.20	5.85	1.47	6.11	1.78
7	.82	.39	4.36	1.30	3.87	1.04														
Stable Residential																				
10	.45	.23	4.51	1.19	5.58	1.61	14	.68	.33	2.15	.52	3.10	.81	21	.84	.73	4.27	1.48	3.75	1.34
9	.41	.27	7.32	2.04	7.55	1.97	18	.52	.19	5.26	1.27	5.55	1.43	13	.44	.22	4.35	1.33	5.22	1.63
12	1.22	.54	5.30	1.22	7.87	1.96	21	.58	.16	3.87	.70	3.34	.69	12	.58	.28	5.37	1.27	7.79	2.06
8	.76	.60	3.87	1.00	4.21	.66	4	.36	.16	2.93	.87	2.40	.74	9	1.45	.67	4.39	1.18	7.02	1.85
														14	1.98	.95	5.79	1.48	4.23	.99
														11	1.56	1.19	6.99	2.27	10.04	2.71
														10	.78	.47	4.70	1.29	5.38	1.51
Peripheral Middle to High SES																				
14	.40	.22	3.28	.92	4.51	1.29	19	--	--	12.84	3.77	5.79	2.46	18	.50	.36	3.18	.88	4.03	1.11
11	.49	.25	1.49	.37	2.71	.56	15	.00	.00	3.51	.54	5.18	1.16	19	.52	.33	9.00	2.02	8.93	2.08
							23	--	--	1.41	.35	1.79	.58	16	.16	.08	4.35	1.01	4.67	1.15
							5	.49	.25	5.50	1.51	9.26	3.02	20	.46	.14	1.68	.38	3.05	.75
							22	1.45	.52	9.26	2.06	9.36	2.19	22	--	--	--	--	5.69	2.81
							6	.00	.00	2.87	.45	15.59	2.52	25	.41	.21	2.88	.95	1.93	.78
							10	4.76	2.00	3.95	.78	2.97	.70	17	.60	.25	3.80	.96	2.83	.71
							2	.85	.80	1.91	.56	4.04	.98	23	--	--	--	--	1.85	.58
							1	.00	.00	4.32	1.00	3.67	.89	26	--	--	--	--	6.97	1.97
														24	--	--	--	--	1.77	.63
Mean	.91	.51	6.35	1.84	7.95	2.28		.95	.47	6.55	1.74	7.90	2.26		.91	.49	6.26	1.83	7.76	2.26

[1] Per 100 Racine population residing in area at mid-census year for police contacts in area but members of all cohorts residing there during 10-year periods.

[2] Per aggregated cohort members residing in area during 10-year periods.

TABLE 2. AGGREGATED IN-AREA COHORT POLICE CONTACT RATES BY TIME PERIODS FOR NEIGHBORHOODS

	INNER CITY							TRANSITIONAL					
	1950's		1960's		1970's			1950's		1960's		1970's	
	Per 100[1] Pop. 1955	Per[2] Cohort Resid.	Per 100 Pop. 1965	Per Cohort Resid.	Per 100 Pop. 1975	Per Cohort Resid.		Per 100 Pop. 1955	Per Cohort Resid.	Per 100 Pop. 1965	Per Cohort Resid.	Per 100 Pop. 1975	Per Cohort Resid.
17	.99	.40	12.52	3.05	14.15	4.55	19	.52	.27	5.49	1.53	9.90	2.61
8	.60	.25	7.71	2.41	10.35	3.80	18	.72	.41	10.20	3.50	14.34	5.10
7	1.00	.65	8.72	3.29	14.69	7.19	16	1.17	.67	4.78	1.52	10.53	3.08
13	.35	.22	7.53	2.39	10.84	5.34	4	.83	.77	4.72	2.04	6.53	2.29
61	7.14	6.25	59.19	13.20	134.74	32.00	65	4.81	5.00	32.23	17.00	29.52	24.50
1	10.46	17.50	105.32	113.75	143.20	70.17	64	5.48	2.67	19.49	7.67	44.44	10.00
6	1.01	1.67	9.18	6.52	12.33	5.13	46	1.25	.30	6.11	1.16	6.07	1.46
12	.77	.56	9.51	3.80	15.57	6.58	49	.79	.26	6.61	1.58	7.73	2.12
9	.95	.38	8.06	2.03	10.49	3.72	50	1.09	.33	5.58	1.26	7.37	1.80
5	.52	.32	5.50	2.11	7.55	2.89	54	.55	.18	4.28	1.08	4.38	1.54
11	.62	.33	9.95	2.27	19.28	6.36	66	--	.25	24.71	5.25	19.74	3.75
10	1.84	1.17	10.58	3.77	17.91	5.64	33	.94	.60	5.58	1.25	4.50	1.49
2	.93	.46	8.88	2.09	8.91	3.07	37	--	.00	--	.41	5.64	.96
3	--	.06	11.00	.50	3.05	.33	60	2.63	2.80	22.03	12.71	46.23	23.00

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[1] Per 100 Racine population residing in area at mid-census year for police contacts in area but members of all cohorts residing there during 10-year periods.

[2] Per aggregated cohort members residing in area during 10-year periods.

TABLE 2. cont.
Page 2.

	STABLE RESIDENTIAL							PERIPHERAL MIDDLE TO HIGH SES					
	1950's		1960's		1970's			1950's		1960's		1970's	
	Per 100 Pop. 1955	Per Cohort Resid.	Per 100 Pop. 1965	Per Cohort Resid.	Per 100 Pop. 1975	Per Cohort Resid.		Per 100 Pop. 1955	Per Cohort Resid.	Per 100 Pop. 1965	Per Cohort Resid.	Per 100 Pop. 1975	Per Cohort Resid.
20	.74	.40	3.94	1.34	5.92	1.57	27	.21	.10	1.31	.40	1.29	.43
21	.29	.15	3.27	1.06	3.20	.90	28	.53	.20	2.49	.61	2.62	.73
22	.15	.08	2.19	.83	2.05	.72	51	.43	.12	1.01	.26	1.74	.55
23	.52	.32	5.15	1.40	11.10	2.67	52	.39	.16	1.65	.40	2.92	.72
29	.36	.13	6.04	1.64	9.47	2.59	55	.26	.07	5.64	1.20	5.26	1.19
30	1.94	3.00	8.70	2.71	9.84	3.03	67	--	4.67	40.00	17.00	16.43	11.00
31	.26	.12	2.88	.53	3.49	.81	47	.38	.17	4.90	1.13	6.20	1.44
32	.66	.39	3.25	.88	6.20	1.67	38	.25	.20	3.64	.90	2.93	.80
34	.51	.17	3.99	.83	3.91	1.00	57	--	.00	--	.02	.95	.11
35	.75	.44	3.22	1.05	4.19	1.17	24	.00	.00	1.77	.68	2.95	.62
36	.84	.31	3.92	.97	2.26	.51	25	.42	.21	4.11	1.14	4.07	1.11
15	.91	.32	2.65	.64	5.70	1.37	26	.00	.00	3.07	.72	2.53	.77
63	5.76	1.58	7.19	1.73	5.49	1.68	39	1.47	1.00	1.71	.40	1.81	.41
53	.57	.38	3.24	.79	4.74	1.10	41	.00	.00	1.45	.26	1.32	.58
62	4.80	6.00	15.77	12.46	21.85	7.50	42	.00	.00	2.82	.57	5.62	1.51
56	.32	.21	3.70	1.12	4.30	.99	68	--	--	--	24.67	49.33	24.67
14	1.02	.47	4.35	1.08	3.07	.62	48	--	.00	2.37	1.23	1.72	.87
							58	--	.00	--	.21	2.07	.16
							59	--	.00	.59	.44	1.55	.82
							70	.00	.00	4.64	1.22	3.15	.59
MEAN								.95	.47	6.44	1.74	7.68	2.26

who were 18 through 27 from the 1942 Cohort, 11 through 20 from the 1949 Cohort, and 6 through 14 from the 1955 Cohort. The 1970s rate includes only ages 28 and older (1942 Cohort), 21 through 27 (1949 Cohort), and 15 through 22 (1955 Cohort). Thus, rates cannot be compared across time periods without caution.

Census Tracts

All four of the inner city census tracts (1, 3, 4, and 5) had higher than average rates of police contact regardless of the rate model considered. At the same time that the population (and proportion of the city's population) and the number of cohort members (and proportion of the cohorts) residing in the inner city were declining, the proportion of Racine's police contacts generated in these areas remained the same or decreased only slightly.[2]

The census tracts that were considered transitional, with the exception of Tract 2, produced little systematic evidence that they differed from others. Tract 2 had more police contacts (higher than average rates during the 1960s and 1970s) than it should have had considering the number of cohort members residing there at different age periods whichever model of expectancy was utilized. All other census tracts had lower than average rates in most time periods whichever model was employed.

Police Grid Areas

Similar outcomes were found for the police grid areas, Areas 8, 12, 13, and 16 having higher cohort rates than the mean for most time periods, particularly Area 12 (the most inner city area). Areas 9, 17, and 20, considered transitional, differed from other areas but were not perfect examples of police contact transition in that time period/cohort differences were irregular. Area 17 had consistently higher mean rates than did Racine and Area 9 had reached that point during the 1970s. Area 20 had such a small proportion of either the city's or any cohort's population that its rates were based on numbers too small to accept as perhaps more than chance statistics. Aside from Grid Areas 5, 6, and 22, all of which had higher than the mean rate of police contacts during the 1970s, the remainder had lower than average police contacts.

Natural Areas

As in other analyses which have been described, Natural Areas 1 and 2, the most distinctive inner city areas, had higher than average police contact rates. Not only that, but for each cohort the proportion of their contacts which took place in these areas had increased while the proportion of each cohort who resided there decreased, time period by time period, i.e., there was a significant cohort by cohort impact on these inner city rates. Of the three other inner city natural areas (3, 4, and 5), all had high contact rates or, as in the case of Area 4, had made the transition in the 1960s. There was little evidence of transition to the status of being a trouble-producing area for those which had been labeled transitional (Areas 6, 7, and 8), although there were time periods and cohorts for which a given area had more police contacts than would be expected considering its proportion of the city's or even a given cohort's population. Of the remaining areas, only Areas 11 and 19 had average police contact rates above the mean in both the 1960s and 1970s.

Neighborhoods

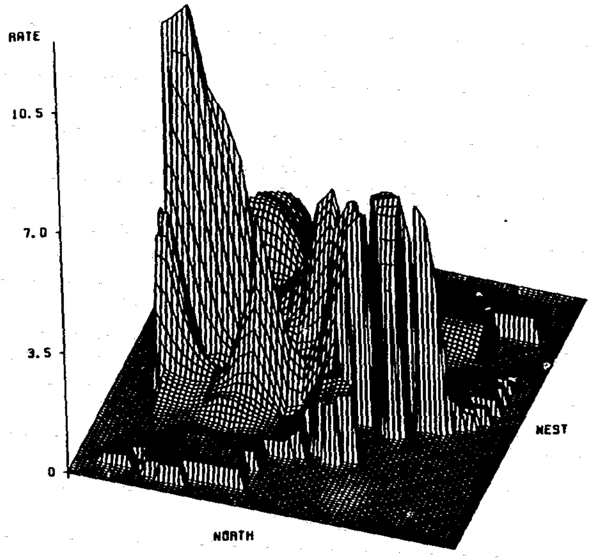
In order that the reader be able to visualize the discussion of neighborhood rates more readily, two sets of three-dimensional maps are included. Maps 1-3 utilize mid-year estimated populations of neighborhoods as the base while Maps 4-6 utilize the number of cohort members residing in the neighborhood as the base. Whichever is considered, similar results are obtained except for the 1950s and both are most alike for the 1970s. The anomalous neighborhood in Map 1 is Neighborhood 63, a peripheral neighborhood with few residents and therefore one with a very high in-area rate because its parks and public use areas have attracted people from many other neighborhoods in the city.

There were 14 neighborhoods which were considered to be a part of the inner city. Almost all had high contact rates based on either the cohort's population residing there each time period or the total population. If they did not have the inner city's disproportional number of police contacts in the early years or for the older cohorts, they had made the transition to disproportional police contacts by the 1960s and 1970s. Neighborhood 3 was the exception. While considered part of the inner city, it was the only area outside of the City of Racine's official inner city (it was part of the Southside Revitalization Area) that had been made part of our inner city configuration of

MAP 1

CONTACTS PER 100 PERSONS BY NEIGHBORHOOD–1950'S

BY NEIGHBORHOOD OF CONTACT

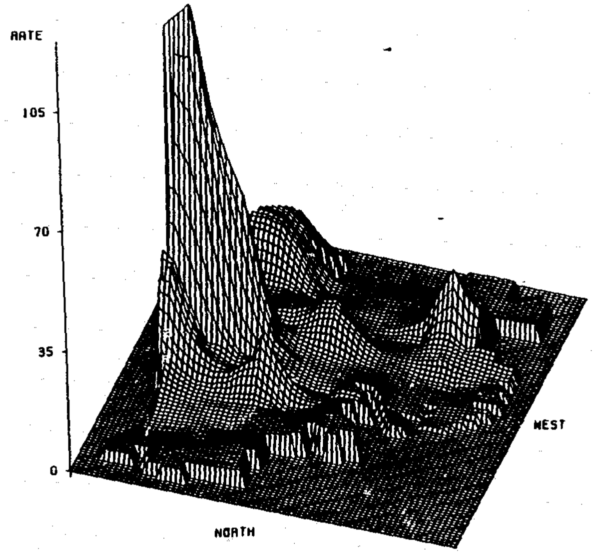


RATE BASED ON 1955 ESTIMATED POPULATION

MAP 2

CONTACTS PER 100 PERSONS BY NEIGHBORHOOD–1960'S

BY NEIGHBORHOOD OF CONTACT

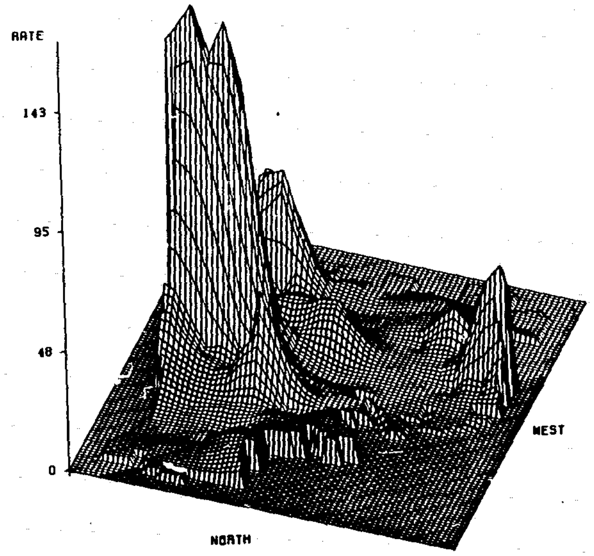


RATE BASED ON 1965 ESTIMATED POPULATION

MAP 3

CONTACTS PER 100 PERSONS BY NEIGHBORHOOD–1970'S

BY NEIGHBORHOOD OF CONTACT

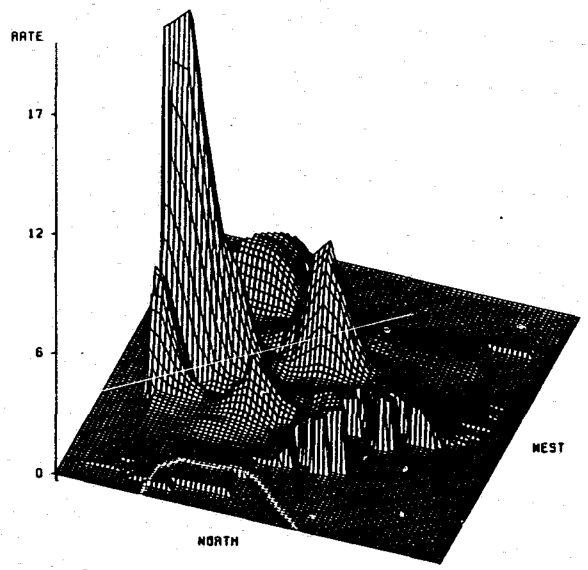


RATE BASED ON 1975 ESTIMATED POPULATION

MAP 4

CONTACTS PER 100 PERSONS BY NEIGHBORHOOD–1950'S

BY NEIGHBORHOOD OF CONTACT

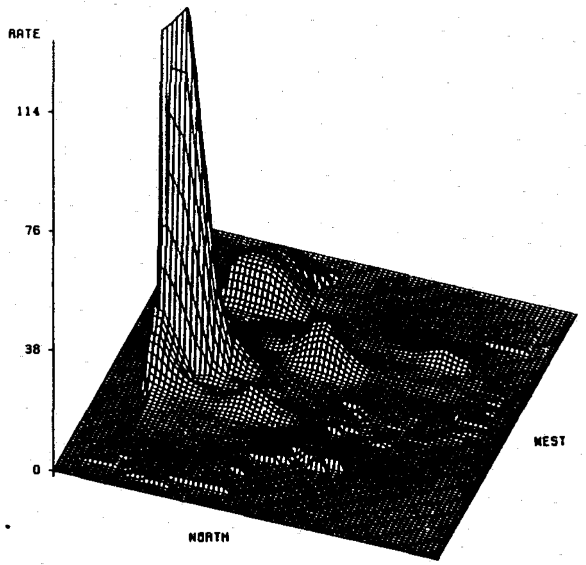


RATE BASED ON COHORT MEMBERS IN NEIGHBORHOOD

MAP 5

CONTACTS PER 100 PERSONS BY NEIGHBORHOOD–1960'S

BY NEIGHBORHOOD OF CONTACT

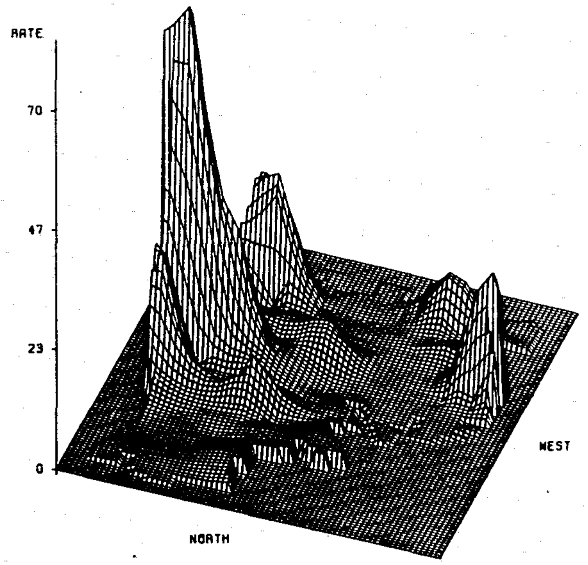


RATE BASED ON COHORT MEMBERS IN NEIGHBORHOOD

MAP 6

CONTACTS PER 100 PERSONS BY NEIGHBORHOOD–1970'S

BY NEIGHBORHOOD OF CONTACT



RATE BASED ON COHORT MEMBERS IN NEIGHBORHOOD neighborhoods. It had only six people in 1960, 194 in 1970, and 199 in 1980, very few people from any cohort, and very few of the police contacts were in this area. Even though it presented a problem in terms of determining what should be considered its census population (part of the area was not officially in the city although surrounded by it), its contact rates were below the mean with only one exception, that for the 1960s when based on the population of the area. Only Neighborhood 5 had mean contact rates below those for the city for all time periods when based on the population of the area. These were the only exceptions to the generally high in-area police contact rates for inner city neighborhoods.

The neighborhoods that were considered interstitial (14 of them) did not differ from other neighborhoods as clearly as did those in the inner city. While some fitted the transitional model with high contact rates in the 1970s, others had lower than average contact rates or were now experiencing a decline.

Only six of the remaining 37 neighborhoods had a pattern of above average contact rates based on their cohort populations or their share of the community's population or were beginning the transition to becoming a high delinquency neighborhood. What this suggests (based on their location and institutional characteristics) is that neighborhoods may also undergo change because they are located adjacent to parks and recreational areas.

TIME PERIOD VARIATION IN POLICE CONTACTS, SERIOUSNESS SCORES, REFERRALS, AND SEVERITY OF SANCTIONS BY PLACE OF RESIDENCE

In this section of the chapter we turn to variation in contact rates with aggregated cohort data for each of the spatial systems by place of residence of cohort members.[3] How cohort seriousness scores, referral rates, and severity of sanctions scores vary by areas within these spatial systems is also described for the first time in this volume.

Census Tracts

Table 3 shows the rate for each variable, computed with: 1) the number of cohort members residing in the area during each time period and 2) the number of persons with contacts, seriousness scores, referrals, or sanctions as denominators as well. There are some anomalies in this table but most are a function of the fact that a given cohort may have a few persons in an area with very lengthy records which markedly differentiate them from others in their area, but having the effect of producing a higher than expected average in the 1950s.

What must be immediately noted is that the inner city becomes more sharply differentiated from other areas by average seriousness scores than by average number of police contacts. Regardless of the time period considered, inner city contact rates are generally higher than rates for other areas; this distinction is greater for the 1970s than for the 1960s, the time period with which comparison is most reasonable based on the average age of persons from the cohorts. As we have said, the inner city is even more sharply differentiated by seriousness

TABLE 3. MEAN NUMBER OF POLICE CONTACTS, SERIOUSNESS SCORES, REFERRALS, AND SEVERITY OF SANCTIONS BY TIME PERIODS FOR COMBINED COHORTS AND PERSONS WITH CONTACT HISTORIES BY CENSUS TRACTS[1]

	POLICE CONTACTS						SERIOUSNESS SCORES						REFERRALS						SEVERITY OF SANCTIONS					
	Cohorts			Persons w/PC			Cohorts			Persons w/SS			Cohorts			Persons w/R			Cohorts			Persons w/SOS		
	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's
TRACTS																								
Inner City																								
1	--	--	5.33	--	--	6.40	--	--	17.00	--	--	20.40	--	--	2.50	--	--	7.50	--	--	13.83	--	--	41.50
3	.62	4.48	6.42	2.47	7.38	8.37	1.61	12.28	19.87	6.43	20.21	25.91	.14	1.37	2.79	1.70	3.76	5.68	.13	2.71	9.15	8.00	15.26	23.36
4	.76	3.55	5.10	2.93	6.47	7.04	1.90	9.71	19.57	7.33	17.70	27.03	.12	1.15	1.73	1.46	4.16	4.05	.21	2.42	8.16	16.00	18.40	20.75
5	.98	3.03	5.71	3.67	5.86	8.25	2.66	8.01	17.29	9.95	15.50	24.98	.28	.72	2.09	2.05	2.92	4.63	.55	2.10	7.38	26.67	17.55	20.06
Transitional																								
2	.55	2.18	2.22	3.47	4.57	3.86	1.47	5.64	5.96	9.33	11.80	10.66	.12	.75	.71	1.83	3.77	.54	.02	1.48	2.81	2.00	17.92	12.23
6	.70	1.68	1.07	3.39	3.75	2.60	1.84	3.98	2.71	8.96	8.89	6.58	.16	.36	.27	1.64	2.48	1.74	.17	1.24	1.27	9.50	15.72	9.94
7	.56	1.66	1.42	2.82	4.50	3.22	1.11	4.15	3.42	6.82	11.28	7.78	.13	.46	.40	6.33	2.85	1.88	.20	1.18	2.00	14.00	12.21	9.94
13	.33	2.19	2.08	2.13	4.75	4.83	.79	5.75	5.77	5.13	12.49	13.38	.06	.57	.71	1.57	2.98	3.63	.06	2.03	3.33	12.00	16.65	17.04
Stable Residential																								
8	1.20	1.76	1.79	3.00	4.42	3.56	2.40	4.24	5.07	6.00	10.67	10.08	.20	.48	.68	2.00	2.50	2.77	.00	1.58	3.31	.00	13.10	16.11
9	.91	2.38	2.29	5.00	5.20	4.32	2.27	5.91	6.32	12.50	12.94	11.90	.39	.70	.85	2.83	3.34	3.26	.09	1.76	3.61	4.00	13.70	15.39
10	.32	2.04	2.10	2.50	4.38	4.56	.78	4.91	5.90	6.06	10.55	12.74	.11	.43	.67	2.00	2.09	2.86	.11	1.08	3.16	14.00	10.31	14.45
12	.66	1.74	1.98	2.79	3.54	3.74	1.67	4.09	5.15	7.10	8.35	9.73	.20	.46	.56	2.08	2.28	2.40	.36	.81	2.81	22.00	8.16	13.30
Peripheral Middle to High SES																								
11	.75	1.05	1.08	4.20	3.31	3.04	2.01	2.36	2.68	11.27	7.42	7.55	.17	.21	.27	2.00	1.74	1.90	.10	.69	1.32	4.00	10.41	10.43
14	.60	.85	.48	3.50	2.74	1.14	1.35	1.93	4.12	7.79	6.23	9.86	.11	.21	.46	1.50	1.97	2.36	.00	.27	1.96	.00	7.00	12.31
15	--	1.82	1.16	--	8.00	2.47	--	4.41	2.76	--	6.47	5.88	--	.41	.32	--	1.50	1.22	--	.82	1.69	--	4.50	7.67

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[1] -- where there are fewer than 5 persons from the combined cohorts in the tract the statistic has been omitted.

scores and this comparison is further heightened in the 1970s. While referral rates are generally higher in the inner city than in other areas, the difference is greatest when frequency of referral is considered for those who have been referred from each cohort, a factor which we believe has contributed to the "hardening" of the inner city, a process which is likewise noted when severity or sanctions scores are considered, particularly as seen in the rates for the 1970s.

Police Grid Areas

Perusal of Table 4 reveals that while the inner city grid areas are sharply differentiated from most other areas on most measures, at least during the 1960s and 1970s, they do not differ from the interstitial areas to the extent that they did when census tracts were the spatial system. One need only remember that the inner city and interstitial areas as delineated by tracts were considerably different from those delineated by police grids to understand how this occurs. Note that the rates for the inner city census tracts were higher in most instances than were the police grid area inner city rates. The heterogeneity of police grid areas depressed the inner city rates, resulting in less difference between them and the transitional areas than in the case of census tracts. There is, of course, considerable in-group variation, particularly when rates are based on persons with contacts, seriousness, referrals, and sanctions, but this is not unexpected and appears during the 1950s when fewer persons from the cohorts were in many of the

TABLE 4. MEAN NUMBER OF POLICE CONTACTS, SERIOUSNESS SCORES, REFERRALS, AND SEVERITY OF SANCTIONS BY TIME PERIODS FOR COMBINED COHORTS AND PERSONS WITH CONTACT HISTORIES BY POLICE GRID AREAS[1]

	POLICE CONTACTS						SERIOUSNESS SCORES						REFERRALS						SEVERITY OF SANCTIONS					
	Cohorts			Persons w/PC			Cohorts			Persons w/SS			Cohorts			Persons w/R			Cohorts			Persons w/SOS		
GRID AREAS	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's
Inner City																								
8	.67	2.82	3.11	2.67	5.68	5.47	1.70	7.63	8.99	6.81	15.38	15.80	.14	.84	1.24	1.53	3.35	4.34	.17	2.41	5.42	14.00	17.39	19.39
12	.75	4.08	5.41	3.10	6.93	7.29	2.13	11.22	21.32	8.85	19.05	28.74	.22	1.33	1.85	2.00	4.34	4.02	.02	2.10	7.49	2.00	17.33	20.64
13	.82	2.98	3.65	3.26	5.70	6.51	2.15	7.89	10.94	8.55	15.08	19.51	.19	.76	1.38	1.68	3.12	4.41	.11	1.92	4.59	9.50	14.43	17.69
16	.50	3.41	3.67	2.47	6.33	5.95	1.23	9.07	11.07	6.03	16.83	17.92	.08	1.20	1.46	1.33	3.65	3.55	.11	2.17	4.80	8.00	16.97	17.45
Transitional																								
9	.60	2.53	3.00	3.03	4.76	5.06	1.53	6.53	8.29	7.70	12.30	13.99	.15	.76	.98	2.08	3.70	3.19	.36	1.65	4.84	20.00	15.94	16.31
17	.86	1.65	1.94	3.38	3.73	3.87	2.27	3.87	5.04	8.97	8.73	10.08	.23	.35	.55	2.20	2.04	2.44	.63	1.48	2.63	23.00	15.89	13.37
20	.23	1.43	2.88	1.67	3.57	5.31	.68	3.49	9.33	5.00	8.71	17.23	.09	.40	1.25	1.00	5.00	5.00	.00	.94	4.21	.00	8.25	33.67
Stable Residential																								
4	.23	.92	1.11	2.08	2.78	2.61	.50	2.05	2.70	4.54	6.21	6.34	.07	.19	.27	1.60	1.75	1.43	.00	.30	1.43	.00	5.08	8.97
14	.70	1.25	1.05	4.50	3.78	3.03	1.85	2.83	2.60	11.94	8.59	7.51	.17	.26	.26	2.13	2.00	2.15	.08	.93	1.19	4.00	12.33	11.39
18	.51	2.55	2.32	2.78	5.12	4.60	1.31	6.32	6.54	5.50	12.67	12.97	.19	.64	.80	2.06	2.65	3.17	.08	1.78	3.57	14.00	12.94	15.58
21	.50	1.85	1.44	2.47	5.25	3.16	1.16	4.94	3.70	5.74	13.99	8.14	.12	.55	.47	1.54	3.57	2.00	.13	1.71	2.49	10.50	17.27	11.84
Peripheral Middle to High SES																								
1	.22	1.15	1.46	1.33	2.95	3.60	.78	2.82	4.06	4.67	7.21	9.98	.22	.35	.50	1.33	2.17	2.33	.67	.99	1.74	12.00	13.63	10.13
2	1.20	.29	1.19	3.00	1.88	3.18	2.40	.80	3.19	6.00	4.13	8.55	.00	.05	.39	.00	1.00	2.09	.00	.02	1.88	.00	1.00	12.33
5	.66	1.49	2.42	3.20	3.32	4.41	1.44	3.54	5.10	7.00	7.86	11.09	.08	.32	.51	1.50	1.73	3.03	.00	.74	2.53	.00	8.31	18.72
6	--	1.35	1.90	--	3.38	2.86	--	3.35	4.19	--	8.38	6.29	--	.35	.62	--	1.40	1.63	--	.60	2.10	--	12.00	7.33
10	.14	1.72	1.09	1.00	4.15	3.69	.14	4.09	3.20	1.00	9.98	10.81	.00	.48	.28	.00	2.00	1.50	.00	.85	1.69	.00	6.50	8.27
15	.20	.94	1.11	2.00	2.44	3.32	.60	2.14	2.80	6.00	5.56	8.40	.20	.13	.24	2.00	3.00	1.50	.00	.44	1.35	.00	10.33	9.18
19	--	1.85	1.44	--	4.36	3.00	--	4.81	4.38	--	11.63	9.13	--	.42	.40	--	2.20	2.00	--	1.12	1.62	--	7.25	9.00
22	.37	1.65	2.42	3.33	4.27	4.79	.83	3.91	6.59	7.50	10.09	13.03	.07	.42	.89	1.33	2.43	3.29	.07	.60	3.93	4.00	7.36	15.70
23	--	.87	1.67	--	4.00	3.19	--	2.04	4.13	--	9.40	7.88	--	.30	.52	--	1.40	2.67	--	.17	2.20	--	4.00	13.40

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[1] -- where there are fewer than 5 persons from the combined cohorts in the grid area the statistic has been omitted.

police grid areas. This is illustrated, for example, by variation in the mean seriousness scores for the <u>cohorts</u> in the 1960s and variation for <u>persons</u> with seriousness scores during that period.

Even though there are more police grid areas than there are census tracts, it is again apparent that changing spatial differences in the distribution of delinquency and crime as measured by involvement with the police and courts are not captured as well by police grid areas as by census tracts. Rather than discuss this table further, for the reader may devote as much time as desired to inspection of these rates, we turn to the system which, of those with larger units, has best captured the phenomena in which we are interested, Natural Areas.

<u>Natural Areas</u>

The first thing that should be noted in reference to Table 5 is that Natural Areas 1 and 2, the most inner city areas of the inner city, have rates which, for every variable, almost always exceed those of the inner city areas as delineated by census tracts and police grid areas. This is the system that was developed from housing quality scores and if there is a shred of substance to the idea that delinquency and crime vary with changes in land use and the physical characteristics of areas as measured by housing quality, rates should be noticeably higher for Areas 1 and 2 than for other natural areas. At the opposite extreme, the peripheral and high SES areas show considerable in-group variation but are, with few exceptions, markedly different

TABLE 5. MEAN NUMBER OF POLICE CONTACTS, SERIOUSNESS SCORES, REFERRALS, AND SEVERITY OF SANCTIONS BY TIME PERIODS FOR COMBINED COHORTS AND PERSONS WITH CONTACT HISTORIES BY NATURAL AREAS[1]

	POLICE CONTACTS						SERIOUSNESS SCORES						REFERRALS						SEVERITY OF SANCTIONS					
	Cohorts			Persons w/PC			Cohorts			Persons w/SS			Cohorts			Persons w/R			Cohorts			Persons w/SOS		
NATURAL AREAS	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's
Inner City																								
1	.82	4.19	7.01	3.17	7.01	9.18	2.05	11.50	24.87	7.91	19.23	32.57	.14	1.26	2.52	1.46	4.48	5.26	.24	2.80	9.55	16.00	19.89	22.87
2	.84	5.20	6.49	3.03	8.46	8.77	2.35	14.48	20.25	8.44	23.59	60.76	.22	1.51	2.78	2.08	3.90	5.18	.51	3.42	10.33	31.00	17.09	24.42
3	1.38	.97	3.70	4.71	2.50	7.12	3.69	2.19	10.56	12.64	5.63	16.35	.40	.18	1.22	1.90	1.27	3.31	.63	.16	4.65	15.00	4.00	14.68
4	.45	3.05	2.31	2.19	5.98	4.74	1.09	8.29	6.36	5.28	16.20	13.07	.06	.93	.80	1.43	3.62	3.52	.08	2.85	4.02	12.00	11.08	16.53
5	.81	3.15	3.49	3.44	5.64	5.12	2.23	8.23	10.22	9.56	14.88	14.98	.22	1.02	1.26	1.70	3.64	3.18	.08	2.38	4.52	3.00	21.62	16.26
Transitional																								
6	.26	1.58	2.34	2.00	3.24	4.12	.49	3.76	6.64	3.83	7.69	11.27	.02	.49	.89	1.00	2.33	3.40	.00	.36	3.09	.00	4.43	14.92
7	--	--	2.74	--	--	4.73	--	--	7.45	--	--	12.86	--	--	1.11	--	--	3.50	--	--	5.74	--	--	18.17
8	.76	3.18	3.28	2.92	6.03	5.89	1.96	8.14	9.03	7.50	15.44	16.20	.35	.85	1.21	2.67	2.98	3.69	.30	2.34	5.23	14.00	16.08	19.50
Stable Residential																								
9	.81	1.83	2.11	3.25	3.48	3.66	2.06	4.26	5.37	8.25	8.13	9.30	.27	.53	.66	2.43	2.83	2.20	.25	.77	3.80	16.00	10.44	12.60
10	.56	1.58	1.70	2.53	3.45	3.32	1.40	3.52	4.29	6.26	7.70	7.47	.19	.33	.47	1.78	1.88	.39	.14	1.25	2.02	12.00	10.95	10.09
11	.77	1.57	1.61	4.11	3.86	4.09	1.94	3.96	4.43	10.33	9.77	11.26	.10	.34	.56	1.25	3.60	2.95	.08	1.40	1.89	4.00	21.40	10.80
12	.54	1.64	1.95	2.23	3.47	3.69	1.37	3.87	4.93	5.69	8.20	9.35	.15	.39	.51	1.60	1.95	2.50	.52	.81	2.28	28.00	8.19	13.37
13	.39	1.29	1.49	2.69	3.71	3.96	.84	3.16	3.87	5.75	9.10	10.31	.06	.24	.46	1.40	2.00	3.00	.00	.71	2.01	.00	8.64	15.17
14	.76	1.93	.86	4.70	4.22	2.31	1.97	4.64	2.19	12.20	10.16	5.88	.19	.45	.16	1.71	2.28	1.35	.31	.91	1.14	9.50	8.29	10.60
21	.20	1.22	1.08	1.00	3.85	2.42	.60	2.73	2.68	3.00	8.38	6.00	.00	.23	.26	.00	1.80	1.11	.00	1.20	.89	.00	16.00	5.67
Peripheral High to Middle SES																								
15	--	--	1.33	--	--	3.42	--	--	4.14	--	--	10.68	--	--	.57	--	--	2.00	--	--	2.24	--	--	13.75
16	.19	1.54	1.32	1.71	3.48	2.85	.52	3.46	3.92	4.71	7.81	8.20	.08	.31	.33	1.67	1.63	1.86	.00	.82	2.22	.00	9.00	11.82
17	.62	1.75	1.21	3.00	5.10	2.88	1.47	4.50	3.02	7.15	13.06	7.18	.12	.54	.37	1.50	3.36	1.82	.16	1.28	2.03	16.00	14.18	10.95
18	.70	.95	1.60	2.88	2.75	3.77	1.79	2.24	4.19	7.38	6.51	9.90	.12	.26	.48	2.00	1.83	2.38	.00	.24	1.92	.00	4.90	11.25
19	.86	2.02	2.48	6.20	4.55	4.85	1.97	4.86	6.93	14.20	10.96	13.54	.25	.53	.92	3.00	2.70	3.47	.11	1.01	4.09	4.00	8.89	16.57
20	.31	1.02	.95	3.43	3.21	2.92	1.48	2.26	2.26	9.00	7.10	6.98	.13	.19	.22	2.00	1.83	1.78	.04	.72	1.11	4.00	11.59	10.00
22	--	--	1.51	--	--	3.42	--	--	4.60	--	--	10.42	--	--	.44	--	--	2.11	--	--	1.79	--	--	9.63
23	--	--	1.48	--	--	2.95	--	--	3.93	--	--	7.85	--	--	.40	--	--	1.78	--	--	2.13	--	--	8.50
24	--	--	1.65	--	--	3.11	--	--	4.20	--	--	7.93	--	--	.49	--	--	2.50	--	--	2.88	--	--	13.11
25	.17	1.05	1.15	2.00	2.47	2.36	.29	2.21	2.84	3.50	5.19	5.82	.06	.25	.31	1.00	2.08	1.32	.00	.56	2.18	.00	8.14	10.88
26	--	--	1.73	--	--	3.20	--	--	4.11	--	--	7.60	--	--	.54	--	--	1.82	--	--	2.59	--	--	9.60

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[1] -- where there are fewer than 5 persons from the combined cohorts in the natural area the statistic has been omitted.

from the inner city and transitional areas, the anomalies occurring when rates are based on persons with seriousness scores, referrals, and sanctions scores. That the transitional areas were becoming similar to the the inner city areas during the 1970s is apparent, but so were several peripheral areas, those which could be noted from inspection of the maps in Chapter 6 based on the distribution of contacts.

Neighborhoods

Neighborhood in-group variation characterizes the cohort place of residence rates shown in Table 6, albeit the inner city and transitional neighborhoods generally have the highest rates. Note, for example, that the average cohort and individual seriousness scores for the inner city neighborhoods are generally higher than those for the transitional areas and that the transitional areas are, in most cases, higher than the stable residential areas, and so on. Also note that by the 1960s and even more so by the 1970s some of the inner city neighborhoods had mean sanctions scores which indicated that some of their residents had been more severely dealt with in the courts than had persons from stable and peripheral neighborhoods.* This is, of course, a function of the seriousness of the behavior and frequency of referrals for these people but suggests even more than did previous data that there is a "hardening" of areas within the inner city and interstitial areas at the same time that delinquency and crime have been increasing in some more stable and peripheral areas. While these rates are based on

TABLE 6. MEAN NUMBER OF POLICE CONTACTS, SERIOUSNESS SCORES, REFERRALS, AND SEVERITY OF SANCTIONS BY TIME PERIODS FOR COMBINED COHORTS AND PERSONS WITH CONTACT HISTORIES BY NEIGHBORHOODS[1]

	POLICE CONTACTS						SERIOUSNESS SCORES						REFERRALS						SEVERITY OF SANCTIONS					
	Cohorts			Persons w/PC			Cohorts			Persons w/SS			Cohorts			Persons w/R			Cohorts			Persons w/SOS		
NEIGH-BORHOODS	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's
Inner City																								
1	--	--	5.33	--	--	6.40	--	--	17.00	--	--	20.40	--	--	2.50	--	--	7.50	--	--	13.83	--	--	41.50
2	.73	4.66	5.32	2.53	8.17	7.54	1.90	11.97	16.34	6.59	21.18	27.78	.14	1.29	2.10	1.60	3.59	4.77	.27	2.89	5.93	8.00	19.41	20.15
3	.28	1.86	3.50	1.67	4.10	5.73	.83	4.82	11.50	5.00	10.60	18.82	.11	.59	1.61	1.00	2.17	5.80	.00	1.18	5.61	.00	8.67	33.67
5	.34	1.81	2.34	4.00	3.53	4.14	.77	4.47	6.71	9.00	8.69	11.89	.02	.63	.84	1.00	3.38	2.48	.00	.43	3.16	.00	6.00	12.25
6	1.73	4.89	2.89	5.20	7.76	3.79	5.40	13.93	6.79	16.20	22.12	8.90	.60	1.85	.76	2.25	7.14	1.93	.13	5.96	3.87	2.00	32.20	14.70
7	1.33	5.04	8.59	4.36	7.73	10.97	3.33	14.29	44.70	10.93	21.91	57.03	.20	1.62	2.32	1.29	4.87	4.30	.35	3.07	11.03	16.00	26.50	24.00
8	.34	3.63	5.52	2.22	6.38	6.92	.92	10.09	17.56	6.00	17.71	22.04	.00	1.33	2.33	.00	5.00	4.97	.00	2.84	10.08	.00	18.67	21.50
9	1.10	3.78	4.26	3.83	7.57	6.53	3.19	10.49	14.07	11.17	20.41	21.57	.45	.82	1.76	2.38	2.65	3.52	1.19	3.76	5.11	50.00	21.38	13.83
10	1.31	1.43	3.49	4.60	2.96	5.82	3.51	3.23	9.40	12.30	6.70	15.67	.29	.27	.96	2.50	1.50	2.94	.86	.09	5.73	15.00	2.50	19.69
11	.42	4.43	6.23	2.00	6.29	8.06	.83	13.45	20.64	4.00	19.10	26.71	.13	1.52	2.86	1.00	4.19	5.73	.00	3.77	12.50	.00	16.60	27.50
12	.61	3.69	7.17	2.78	6.38	9.56	1.17	10.53	21.63	5.33	14.34	28.83	.17	1.30	4.54	2.33	3.46	9.08	.00	1.20	10.75	.00	8.56	22.43
13	.92	3.71	8.54	3.36	6.88	11.12	2.41	10.31	26.11	8.79	19.53	34.00	.22	1.04	4.32	1.83	4.04	8.07	.00	2.52	8.97	.00	18.67	22.77
17	.74	2.48	3.08	2.13	7.80	4.56	1.84	5.97	9.05	5.27	12.53	13.41	.16	.65	1.03	1.75	2.56	2.56	.00	1.76	5.73	.00	12.33	16.36
61	--	2.90	--	--	4.83	--	--	7.60	--	--	12.67	--	--	.60	--	--	2.00	--	--	1.30	--	--	6.50	--
Transitional																								
4	.14	1.33	.98	1.00	4.07	2.17	.28	2.96	2.35	3.00	9.07	5.22	.00	.33	.27	.00	2.50	1.08	.00	.89	.75	.00	20.50	5.43
16	.58	1.95	3.91	2.63	3.47	6.51	1.30	4.50	11.15	6.00	8.00	18.59	.19	.53	1.34	2.33	2.43	3.63	.00	.58	5.17	.00	7.40	17.68
18	.70	2.00	2.56	3.71	4.31	5.59	1.76	5.70	6.77	9.29	12.27	14.77	.11	.75	.90	2.00	3.23	3.91	.32	1.09	4.73	12.00	15.25	20.64
19	.22	2.73	2.85	1.25	5.61	5.53	.53	7.47	7.97	3.00	15.36	15.47	.07	.68	1.09	1.00	2.63	4.50	.00	3.34	4.42	.00	19.00	14.60
33	.56	1.68	1.35	2.33	5.23	3.47	1.44	4.61	3.18	6.00	12.58	8.21	.12	.51	.41	1.50	2.25	2.86	.00	1.02	1.00	.00	9.22	7.00
37	.33	3.66	2.83	1.40	7.14	4.86	.71	10.80	7.54	3.00	21.29	12.93	.05	1.29	1.04	1.00	4.82	3.57	.00	3.10	6.04	.00	15.88	20.71
46	.52	3.04	4.94	2.33	6.16	6.89	1.41	7.75	11.08	6.33	21.32	18.95	.11	.75	1.49	1.00	2.52	3.88	.00	1.88	6.85	.00	10.36	21.19
49	1.00	3.96	2.35	4.86	7.23	4.27	2.62	10.40	7.13	12.71	18.98	12.97	.50	1.30	.97	2.83	4.75	3.87	.12	4.38	3.42	4.00	18.82	15.77
50	.19	1.50	2.99	1.33	3.09	5.23	.52	3.38	8.49	3.67	6.94	15.70	.05	.24	1.12	1.00	1.31	3.46	.00	.63	4.42	.00	5.63	17.21
54	.64	2.20	2.13	3.22	4.18	3.83	1.69	5.33	5.42	8.44	10.13	9.72	.24	.41	.58	2.75	1.72	2.31	.31	.68	2.46	14.00	13.00	10.67
60	.40	1.29	--	2.00	2.25	--	.80	2.43	--	4.00	4.25	--	.00	.14	--	.00	1.00	--	.00	1.00	--	.00	7.00	--
64	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
65	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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[1] -- where there are fewer than 5 persons from the combined cohorts in the neighborhood the statistic has been omitted.

	POLICE CONTACTS						SERIOUSNESS SCORES						REFERRALS						SEVERITY OF SANCTIONS					
	Cohorts			Persons w/PC			Cohorts			Persons w/SS			Cohorts			Persons w/R			Cohorts			Persons w/SOS		
	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's	50's	60's	70's
Stable Residential																								
14	.92	1.89	.90	5.00	4.02	2.40	2.37	4.51	2.24	12.89	9.61	6.00	.24	.42	.17	1.71	2.28	1.43	.39	.60	1.10	9.50	7.38	10.58
15	.84	1.82	2.20	3.56	3.47	3.48	2.47	4.03	5.24	10.44	7.69	8.31	.29	.44	.59	2.20	3.00	1.69	.42	.44	4.87	16.00	6.75	13.18
20	.15	3.32	1.58	1.20	7.26	4.08	.45	8.88	4.16	3.60	19.41	10.73	.00	.86	.57	.00	4.25	4.22	.00	3.78	2.42	.00	24.78	20.25
21	.22	1.00	1.13	1.29	2.65	2.63	.34	2.00	2.71	2.33	5.31	6.33	.02	.20	.24	1.00	1.56	1.50	.00	.33	1.10	.00	4.60	8.63
22	.32	1.59	.98	2.40	3.91	3.07	.79	4.00	2.47	6.00	9.82	7.73	.11	.26	.21	2.00	2.80	1.67	.00	.85	1.57	.00	11.50	18.50
23	1.21	1.22	2.07	3.29	3.15	4.21	2.79	2.78	5.41	7.57	7.15	10.97	.21	.28	.64	2.00	2.11	2.93	.00	.55	3.06	.00	9.25	14.07
29	.47	1.33	2.01	2.33	2.89	3.90	1.17	3.01	5.02	5.83	6.53	9.73	.17	.26	.42	1.67	1.18	2.79	.93	.72	2.06	28.00	6.22	16.00
30	--	1.90	1.92	--	4.21	3.55	--	4.42	4.86	--	9.79	9.00	--	.45	.62	--	2.33	2.09	--	.77	2.32	--	12.00	8.60
31	.48	1.79	1.88	2.00	3.68	3.53	1.20	4.35	4.84	5.00	8.96	9.08	.04	.47	.57	1.00	2.53	2.53	.00	.89	2.53	.00	8.36	14.62
32	.54	1.48	1.33	2.38	3.47	2.92	1.47	3.45	3.42	6.46	8.12	7.52	.11	.31	.40	2.00	2.64	2.00	.00	1.66	1.51	.00	24.88	9.76
34	.13	1.51	1.51	1.00	4.94	3.26	.25	4.71	3.59	2.00	15.44	7.74	.00	.54	.41	.00	3.56	1.70	.00	1.24	2.78	.00	10.43	11.40
35	.50	1.11	1.91	2.83	2.52	3.41	1.06	2.48	4.82	6.00	5.59	8.59	.18	.23	.50	1.50	2.00	1.94	.35	1.16	2.83	12.00	11.83	11.69
36	.78	1.90	.99	3.46	5.47	2.75	1.95	4.55	2.36	8.69	13.12	6.56	.17	.53	.31	1.43	3.47	1.55	.28	1.17	1.52	16.00	19.17	9.00
53	.76	1.13	1.76	5.50	3.40	4.54	1.72	2.49	4.60	12.50	7.48	11.82	.10	.19	.47	1.50	2.00	3.09	.14	1.00	1.83	4.00	12.50	14.67
56	.14	1.63	1.67	1.50	3.81	2.47	.28	3.68	4.71	3.00	8.58	11.61	.07	.32	.50	1.00	2.45	2.83	.00	.66	1.74	.00	6.75	9.26
62	.22	1.69	1.05	2.00	3.67	2.56	.67	4.15	2.91	6.00	9.00	7.11	.00	.31	.41	.00	4.00	2.25	.00	1.92	2.05	.00	12.50	11.25
63	.25	1.88	1.08	1.50	4.90	2.45	.75	4.46	2.76	4.50	11.60	6.27	.00	.73	.12	.00	2.71	1.50	.00	1.81	1.20	.00	9.40	10.00
Peripheral Middle to High SES																								
24	--	1.82	1.10	--	2.67	2.38	--	4.41	2.44	--	6.47	5.29	--	.41	.29	--	1.50	1.25	--	.82	1.27	--	4.50	6.00
25	.07	.49	1.77	1.00	2.00	4.67	.21	1.21	5.06	3.00	5.12	13.33	.07	.17	.61	1.00	1.50	3.20	.00	.08	1.72	.00	3.00	12.36
26	--	.69	.81	--	2.20	3.13	--	1.50	2.52	--	4.80	9.75	--	.25	.26	--	4.00	2.67	--	.72	.90	--	23.00	9.33
27	.20	.71	1.00	2.00	2.14	1.84	.40	1.14	2.34	4.00	3.43	4.32	.10	.07	.29	2.00	1.50	1.11	.00	.52	2.97	.00	11.00	13.00
28	.60	.90	1.29	5.25	2.92	3.40	1.29	2.15	3.15	11.25	6.96	8.32	.06	.25	.30	1.00	1.91	1.54	.00	.08	1.15	.00	2.33	8.44
38	1.20	1.78	1.53	3.00	4.44	3.02	2.40	3.43	4.18	6.00	10.84	8.26	.20	.50	.53	2.00	2.67	2.65	.00	1.70	2.75	.00	13.60	13.76
39	2.25	1.24	.82	6.75	4.24	2.70	6.58	3.09	2.02	19.75	10.53	6.65	.58	.34	.21	7.00	2.00	1.75	.33	1.10	1.17	4.00	12.80	9.63
41	--	.96	1.73	--	3.25	3.21	--	2.22	4.65	--	7.50	8.64	--	.07	.42	--	2.00	1.57	--	.37	2.50	--	10.00	9.29
42	.29	.91	1.21	2.00	2.18	3.76	.86	2.00	3.04	6.00	4.82	9.47	.29	.08	.23	2.00	2.00	1.33	.00	.30	1.23	.00	8.00	9.29
47	.57	1.73	2.45	6.50	5.04	4.91	1.22	3.96	6.63	14.00	11.52	13.25	.04	.57	.97	1.00	3.17	4.13	.00	.07	4.92	.00	2.50	18.53
48	--	3.08	1.67	--	5.00	3.42	--	8.54	5.08	--	13.88	10.42	--	.69	.49	--	2.25	2.11	--	1.92	1.97	--	8.33	9.63
51	.27	1.17	.39	3.50	2.89	1.86	.54	2.49	1.03	7.00	6.16	4.86	.04	.19	.12	1.00	1.29	1.00	.00	.28	.61	.00	4.33	6.67
52	.26	.91	.88	1.33	3.13	2.32	.87	1.95	1.88	4.50	6.69	4.95	.10	.20	.24	1.00	1.83	2.00	.00	.89	1.40	.00	16.33	11.67
55	.29	1.78	1.37	1.14	3.75	3.22	.79	4.17	4.35	3.14	9.11	10.22	.04	.37	.41	1.00	1.47	2.20	.00	1.24	2.65	.00	9.13	14.30
57	.37	1.38	.95	2.14	5.29	2.47	.80	3.77	2.64	4.71	14.41	6.82	.15	.29	.34	2.00	3.80	1.25	.12	2.29	1.75	5.00	37.25	11.00
58	--	2.79	1.60	--	9.75	2.86	--	7.14	3.64	--	25.00	6.50	--	.86	.52	--	6.00	2.17	--	3.07	1.56	--	21.50	7.80
59	--	.44	1.68	--	2.00	3.35	--	1.11	5.03	--	10.00	10.06	--	.33	.56	--	3.00	2.71	--	.00	2.35	--	.00	13.33
67	--	.00	1.73	--	.00	3.71	--	.00	4.47	--	.00	9.57	--	.00	.53	--	.00	1.33	--	.00	3.87	--	.00	9.67
68	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
70	--	2.11	.35	--	3.17	1.20	--	3.21	.82	--	7.50	2.80	--	.29	.06	--	2.00	1.00	--	.00	.24	--	.00	4.00

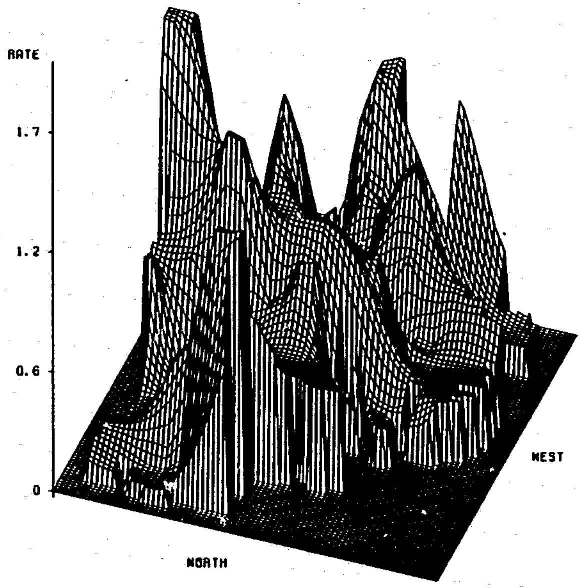
place of residence, it is not inappropriate to refer to "hardening" of inner city neighborhoods because most of the police contacts by persons who reside in these areas are committed in their area of residence. Several series of maps are now included for rates by neighborhood of residence. Maps 7-9 indicate how cohort residents of the inner city neighborhoods have become even more differentiated from other neighborhoods over the years. These maps also highlight the development of delinquency and crime among those who reside in several more peripheral neighborhoods, as compared with stable residential areas. Maps 10-12 present a similar picture for mean seriousness of offense scores in neighborhoods but mark off the inner city even more sharply by 1970. Inner city neighborhoods are also clearly differentiated by 1970, as shown by the next series, Maps 13-15, which utiize only those cohort members with police contacts as a basis for determining the neighborhood's mean seriousness scores. The last series of maps, Maps 16-18, reveals that the mean referral rate for neighborhoods is very similar to mean seriousness rates.

We have pointed out in earlier chapters that persons who reside in some areas outside the inner city and transitional areas are more likely to have their police contacts in other areas, some far removed from their places of residence and in areas with targets or attractions not available close to home. Thus, as becomes apparent from examination of Table 6, there are neighborhoods throughout the city in addition to those in the

MAP 7

MEAN NUMBER OF CONTACTS BY NEIGHBORHOOD—1950'S

BY NEIGHBORHOOD OF RESIDENCE

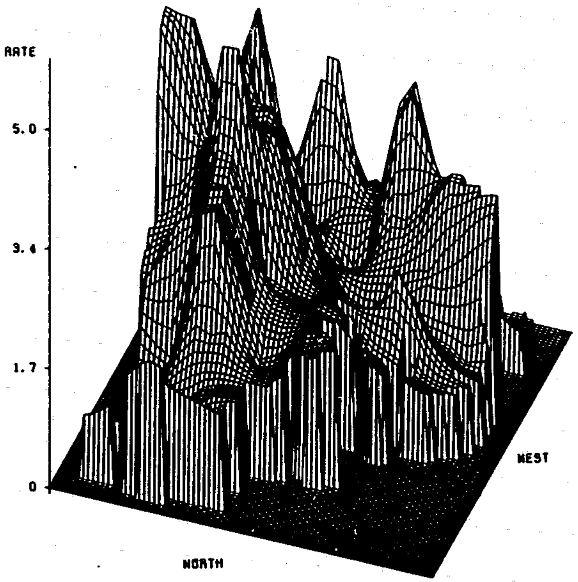


BASED ON COHORT MEMBERS IN NEIGHBORHOOD

MAP 8

MEAN NUMBER OF CONTACTS BY NEIGHBORHOOD—1960'S

BY NEIGHBORHOOD OF RESIDENCE

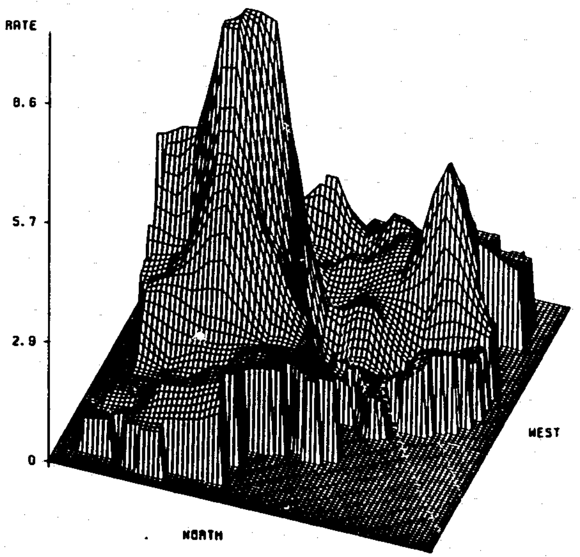


BASED ON COHORT MEMBERS IN NEIGHBORHOOD

MAP 9

MEAN NUMBER OF CONTACTS BY NEIGHBORHOOD—1970'S

BY NEIGHBORHOOD OF RESIDENCE

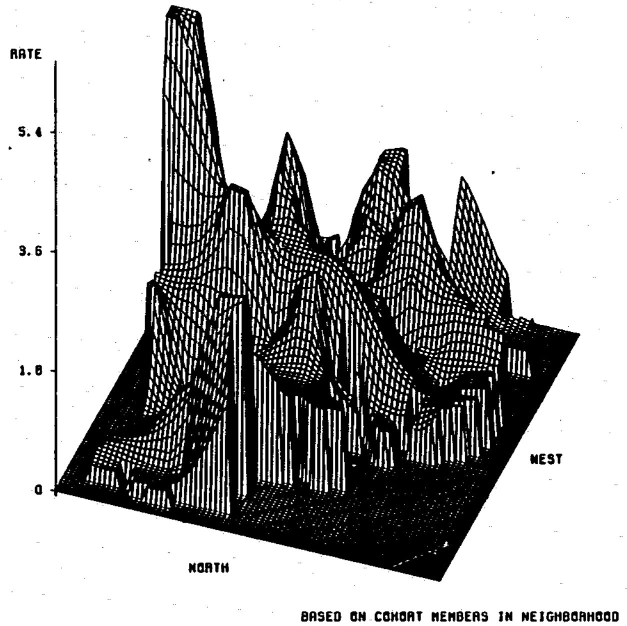


BASED ON COHORT MEMBERS IN NEIGHBORHOOD

MAP 10

MEAN SERIOUSNESS SCORES BY NEIGHBORHOOD--1950'S

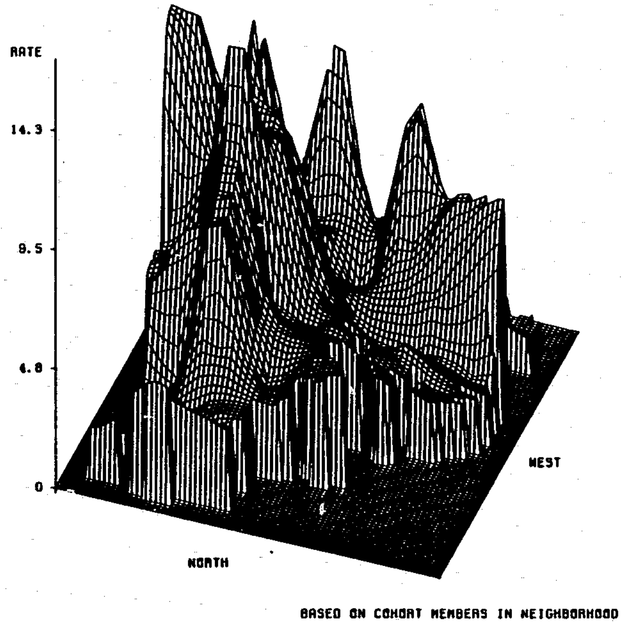
BY NEIGHBORHOOD OF RESIDENCE



MAP 11

MEAN SERIOUSNESS SCORES BY NEIGHBORHOOD--1960'S

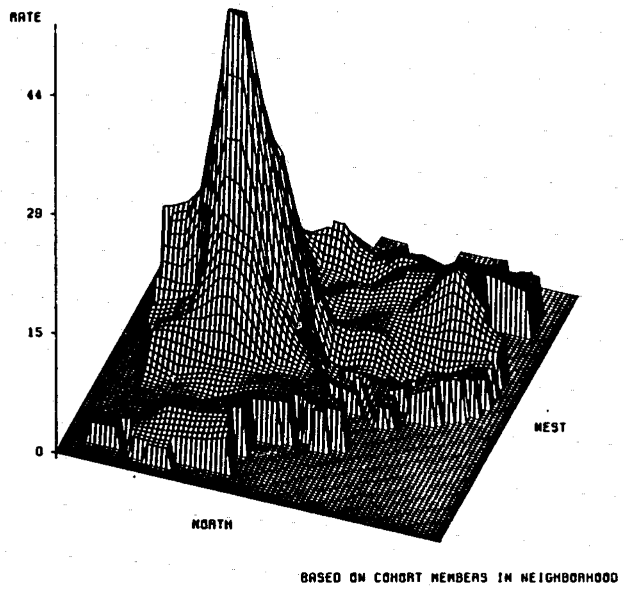
BY NEIGHBORHOOD OF RESIDENCE



MAP 12

MEAN SERIOUSNESS SCORES BY NEIGHBORHOOD--1970'S

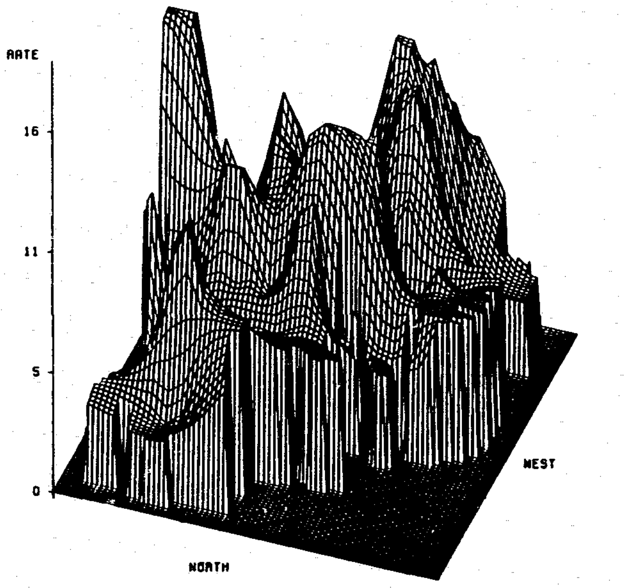
BY NEIGHBORHOOD OF RESIDENCE



MAP 13

MEAN SERIOUSNESS SCORES BY NEIGHBORHOOD--1950'S

BY NEIGHBORHOOD OF RESIDENCE

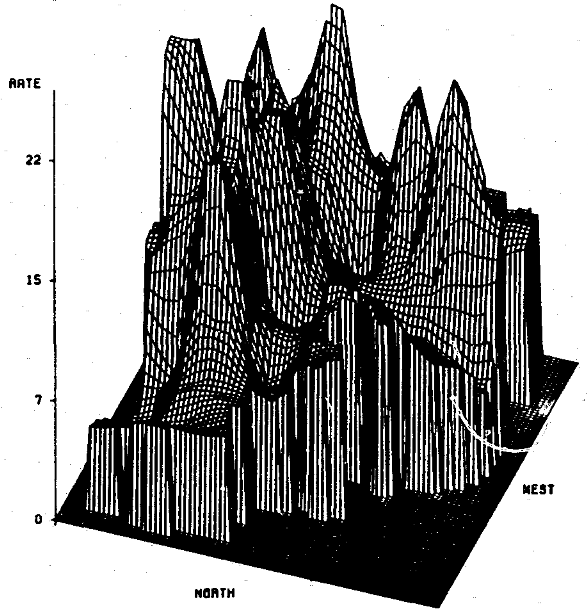


BASED ON COHORT MEMBERS IN NEIGHBORHOOD WITH CONTACTS

MAP 14

MEAN SERIOUSNESS SCORES BY NEIGHBORHOOD--1960'S

BY NEIGHBORHOOD OF RESIDENCE

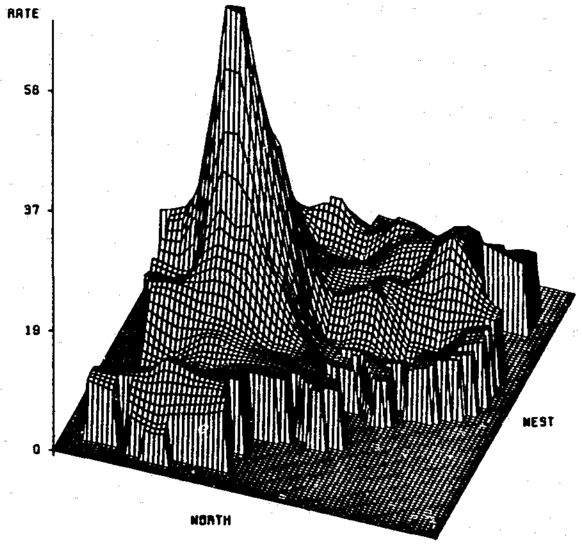


BASED ON COHORT MEMBERS IN NEIGHBORHOOD WITH CONTACTS

MAP 15

MEAN SERIOUSNESS SCORES BY NEIGHBORHOOD--1970'S

BY NEIGHBORHOOD OF RESIDENCE

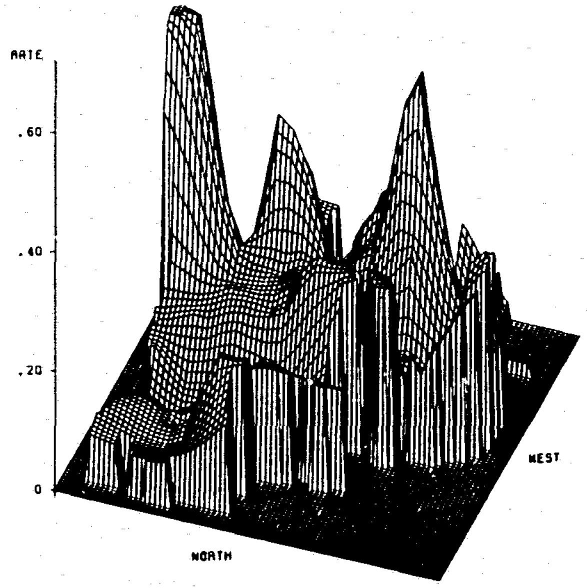


BASED ON COHORT MEMBERS IN NEIGHBORHOOD WITH CONTACTS

MAP 16

MEAN NUMBER OF REFERRALS BY NEIGHBORHOOD—1950'S

BY NEIGHBORHOOD OF RESIDENCE

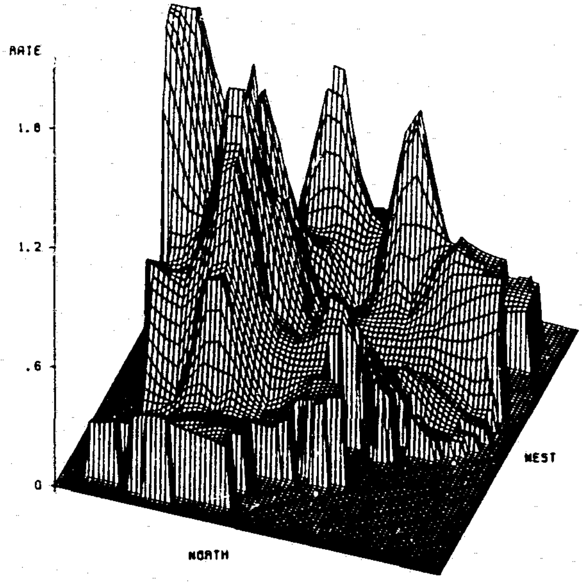


BASED ON COHORT MEMBERS IN NEIGHBORHOOD

MAP 17

MEAN NUMBER OF REFERRALS BY NEIGHBORHOOD—1960'S

BY NEIGHBORHOOD OF RESIDENCE

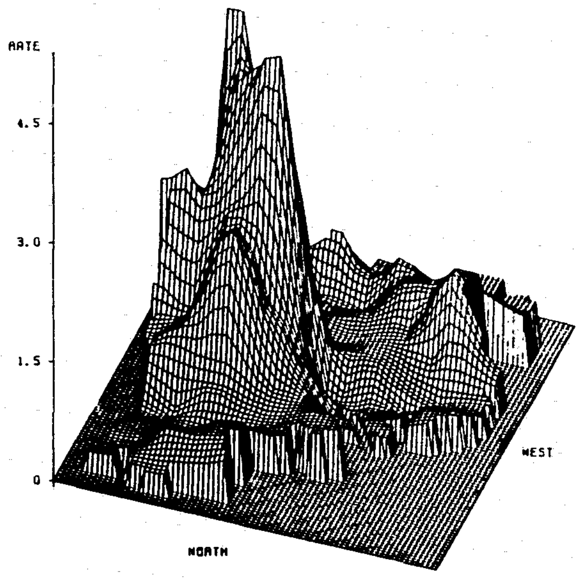


BASED ON COHORT MEMBERS IN NEIGHBORHOOD

MAP 18

MEAN NUMBER OF REFERRALS BY NEIGHBORHOOD—1970'S

BY NEIGHBORHOOD OF RESIDENCE



BASED ON COHORT MEMBERS IN NEIGHBORHOOD

inner city which constitute centers of trouble, some of which had previously been marked as having high rates of in-area offenses and others which have high rates of serious offenses by their residents. How these overlap most frequently in the inner city is shown on Map 19. The location of these neighborhoods suggests that some not recognized as transitional areas by their land use and housing characteristics are in the process of transition to becoming delinquent neighborhoods.

Before leaving this chapter brief mention must be made of the more complex time-period analysis provided for by age and time period aggregation of the cohort data.

A COHORT AND TIME-PERIOD ANALYSIS OF POLICE CONTACT DATA BY PLACE OF RESIDENCE

In order to facilitate comparison of the rates for each cohort in each time period in each area of each spatial system, we have developed several expected patterns based on the general transition model and rates which were calculated for the entire community. Table 7 should clarify this approach. The figures in italics in each cell indicate the ages of cohort members during that time period. The other figures are average number of contacts per person in the cohort during that time period. According to all that we know about the cohorts, about time period differences, and about age differences, the rates in the table should have been high, medium, or low as indicated, and they were.

MAP 19

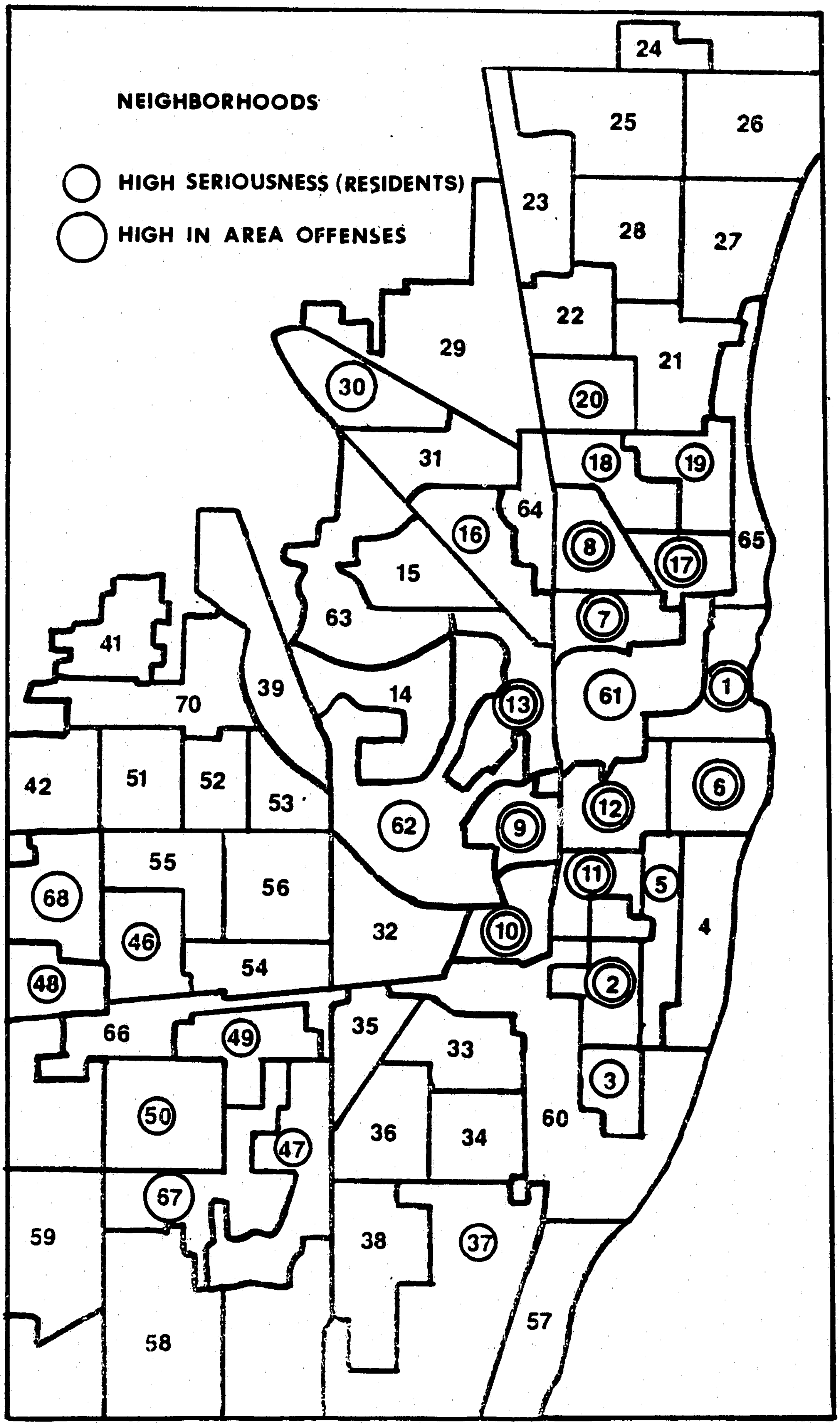

NEIGHBORHOODS
HIGH SERIOUSNESS (RESIDENTS)
HIGH IN AREA OFFENSES
24
25
26
23
28
27
22
29
21
30
20
31
18
19
64
16
8
17
65
15
7
63
41
1
61
14
13
39
70
42
51
52
53
6
12
62
9
55
11
5
56
68
46
10
32
4
54
2
48
66
49
35
33
3
50
47
36
34
60
67
59
38
37
57
58

TABLE 7. AGE GROUP, COHORT, AND TIME PERIOD VARIATION IN MEAN NUMBER OF POLICE CONTACTS IN RACINE

	Time Periods		
Cohort	1948-1959	1960-1969	1970+
1955	-- -- --	.98 Low *6-10*	2.93 High *15-22*
1949	.13 Low *6-10*	2.97 High *11-20*	1.64 Med. *21-27*
1942	1.23 Med. *6-17*	2.87 High *18-27*	.91 Low *28-34*

When each census tract was observed we found considerable variance from the model for the city, Census Tracts 1, 2, 3, 4, and 5 having rates above or considerably above those for the model for every cohort for every time period with the exception of the 1942 Cohort during the 1948 through 1959 time period where this cell was lower than the city average in all tracts except Tract 5. Tract 13 came close to the city level cohort by cohort and had a higher rate than expected for the 1955 Cohort in the 1970 and later time period. This was the only tract with this characteristic but the higher rate was expected since it was considered a transition tract. All other tracts were at or below the city average in almost every time period, as expected.

The same procedure was used in examination of the police grid areas. Areas 8, 12, 13, and 16 had rates significantly above the city rates while all other areas were either below or showed mixed characteristics, none closely fitting the transitional model. Natural Area 2 deviated from city rates more than did others, followed by Area 1. Areas 3, 4, and 5 fitted the transitional pattern and all had contact rates approaching those for Areas 1 and 2 during the 1970s for the 1955 Cohort. Areas 6 and 8, which were considered transitional, also had patterns very similar to Areas 3, 4, and 5 and had been appropriately classified. What we see here is that when the data are presented with fewer breakdowns, i.e., for the time periods and cohorts alone, they fit the models rather well. While there was some suggestion of transition in the pattern of rates for several other natural ares, none fitted the pattern. Most other areas had a mix of deviations with some showing time period transition but most close to city rates or deviating in random fashion.

The pattern of deviation from city rates for neighborhoods showed that every inner city area either had rates significantly above those for the city or, as in only two cases, was definitely in transition.

SUMMARY

Police contact rates by place of contact for census tracts, police grid areas, natural areas, and neighborhoods, when examined in relation to time period and cohort models of change, revealed spatial variation that was fairly consistent with what would be expected, i.e., higher rates in the inner city, with lower rates in more peripheral, higher SES areas. The decline, however, from the inner city to the periphery was not marked by a high degree of regularity, although the pattern of inner city and interstitial high rates became more pronounced from decade to decade.

Departures from the model could be accounted for by the attractiveness of some areas as places of leisure time use or by the prevalence of targets for delinquent and criminal behavior. Similarly, tables and maps showing combined cohort, time period, and place of residence variation in police contact rates, seriousness scores, referral rates, and severity of sanctions scores revealed that none of these measures declined evenly with increasing distance from the city center during any of the periods observed. On the other hand, it was clear that by the 1970s inner city and interstitial neighborhoods were more sharply delineated than they had been in the 1950s and 1960s. While in-area contact rates and place of residence rates were not congruent, it was also apparent that some inner city and interstitial neighborhoods were developing enduring patterns of delinquency and crime. A closer look at the dynamics of this process is taken in the chapter which follows.

FOOTNOTES

[1] The problem of meaningful rates has been discussed by Keith D. Harris in a paper presented to the Annual Meeting of the American Society of Criminology, Dallas, 1978, "Problems in the Development of Risk-Related Crime Rates," supported by Grant No. 78-NI-AX-0064 of the National Institute of Law Enforcement and Criminal Justice.

[2] These tracts, as in every other analysis, remained the core of the problem. They are, in cohort after cohort and time period after time period, the locale in which at least 40% of all police contacts took place. In the extreme case, while less than 6% of the 1942 Cohort still resided in these four inner city tracts in the 1970s, 48% of the police contacts which members of this cohort had took place in these tracts. For the 1949 Cohort 13.8% resided in the inner city in the 1970s but 45% of the police contacts by this cohort took place in the inner city in the 1970s. The 1955 Cohort had a larger proportion of its members residing in these inner city tracts in the 1970s (17.0%) and 36.5% of that cohort's contacts occurred in the inner city. Age differences from cohort to cohort play a part in the decline in the proportion of each cohort's contacts that took place in the inner city since younger persons (the 1955 Cohort) have a greater percent of their contacts closer to home--but still these rates remained higher than for other areas.

[3] Stephen P. Lab, "Cohort Analysis and Changing Offense Rates: In Search of the Lost Method," unpublished paper based on the

three Racine cohorts, has found that time period effects, especially for females, are greater than age group and cohort effects.

* Evaluation of the existing literature may lead to the conclusion that police, probation officers, and judges do not discriminate against juveniles or adults on a basis of race/ethnicity or socioeconomic status when controls for seriousness of offenses, previous record, etc., have been introduced: Nathan Goldman, "The Differential Selection of Juvenile Offenders for Court Appearance," National Council on Crime and Delinquency, 1963; Alexander W. McEachern and Riva Bauzer, "Factors Related to Disposition in Juvenile Police Contacts," in M.W. Klein (ed.), Juvenile Gangs in Context, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1967, pp. 148-160; William F. Hohenstein, "Factors Influencing the Police Disposition of Juvenile Offenders," in T. Sellin and M.E. Wolfgang (eds.), Delinquency: Selected Studies, New York: John Wiley and Sons, Inc., 1969, pp. 138-149; Donald J. Black, "Production of Crime Rates," American Sociological Review, Vol. 35, 1975, pp. 733-748; Donald J. Black and Albert J. Reiss, Jr., "Police Control of Juveniles," American Sociological Review, Vol. 35, 1970, pp. 63-77; Theodore G. Chiricos and Gordon P. Waldo, "Socioeconomic Status and Criminal Sentencing: An Empirical Assessment of a Conflict Proposition," American Sociological Review, Vol. 40, 1972, pp. 753-772; Normal L. Weiner and Charles V. Willie, "Decisions by Juvenile Offenders," American Journal of Sociology, Vol. 77, 1971, pp. 199-210.

There are other studies which suggest that the opposite is the case: Irving Piliavin and Scott Briar, "Police Encounters with Juveniles," American Journal of Sociology, Vol. 70, 1964, pp. 206-214; Theodore N. Ferdinand and Elmer C. Luchterhand, "Inner-city Youths, the Police, the Juvenile Court, and Justice," Social Problems, Vol. 17, 1970, pp. 510-527; Theodore G. Chiricos, Phillip D. Jackson and Gordon P. Waldo, "Inequality in the Imposition of a Criminal Label," Social Problems, Vol. 19, 1972, pp. 553-572; Terrence P. Thornberry, "Race, Socioeconomic Status and Sentencing in the Juvenile Justice System," Journal of Criminal Law and Criminology, Vol. 64, 1973, pp. 90-98; William R. Arnold, "Race and Ethnicity Relative to Other Factors in Juvenile Court Dispositions," American Journal of Sociology, Vol. 77, 1971, pp. 211-227; Alan J. Lizotte, "Extra-legal Factors in Chicago's Criminal Courts: Testing the Conflict Model of Criminal Justice," Social Problems, Vol. 25, 1978, pp. 564-580.

While these are only selected studies of discrimination at various levels in the justice system, they are illustrative of the conflicting findings that have been reported and indicate the basis on which it has been concluded that evidence of direct discrimination by the police or courts has been considered sparse or the conclusion that discrimination is present in some places at some times but not in other places as concluded by Don C. Gibbons, Delinquent Behavior, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1976 and LaMar T. Empey, American Delinquency: Its Meaning and Construction, Homewood: The Dorsey Press, 1978.

Chapter 7. A Dynamic Model of Cohort and Age Period Variation in Delinquency and Crime

In the last chapter we described time period variation in police contacts and other measures of delinquent and criminal involvement based on aggregated cohorts. The basis for describing more dynamic aspects of the process by treating cohorts separately was presented but postponed for the moment. It is to this topic which we shall now turn. Diagram 2 in Chapter 6 should again be helpful as these data are presented.

DEVELOPING THE MODEL

Table 1 provides us with an opportunity to compare the percent of each cohort with police contacts, the average number of police contacts per person in the cohort, and the average number of contacts by persons with contacts in each cohort with controls for age. Note that each measure is very low for the age group 6 through 10 in each cohort and increases in each age group through the 15 through 17 age group but that the measure may or may not increase for the 18 through 20 age group. Since contact rates peak at age 16 or 17 for the cohorts, depending on area and so on, this is not surprising. While all measures increase between the 1942 and 1949 Cohorts for each age group (with one exception), sizeable increases are not found between the 1949 and 1955 Cohorts.

One way to characterize age and cohort variation by areas within each spatial system is to consider how the statistics for each area differ from the statistics in Table 1. We would expect

TABLE 1. MEASURES OF CONTACT FREQUENCY BY AGE GROUP AND COHORT

Percent of Cohort with Police Contacts

Cohort	Ages 6-10	11-14	15-17	18-20
1955	13.6	25.1	40.8	41.2
1949	9.1	26.6	42.3	43.4
1942	3.7	16.3	38.3	35.7

Average Number of Contacts Per Person in Cohort

Cohort	Ages 6-10	11-14	15-17	18-20
1955	.27	.91	1.45	1.28
1949	.16	.64	1.41	1.31
1942	.05	.31	1.16	1.09

Average Number of Contacts by Persons with Contacts

Cohort	Ages 6-10	11-14	15-17	18-20
1955	2.0	3.6	3.6	3.1
1949	1.8	2.4	3.3	3.0
1942	1.3	1.9	3.0	3.1

inner city areas to be higher on each measure for each cohort and each age group. We would expect the interstitial and transitional areas to become higher cohort by cohort and to show an age group transformation following a different pattern from that for the city as a whole and a markedly different transformation from that shown for stable residential areas. The complexity of our expectations is also increased by the fact that persons at a given age in one cohort may have resided in the area when it had somewhat different characteristics from that which it had when persons from another cohort resided there. This involves the element of time period change and compounds the difficulty of making comparisons between cohorts for persons aged 11 through 14 in the 1942 and 1949 Cohorts but does not affect comparisons for the 11 through 14 age group between the 1949 and 1955 Cohorts, as can be readily discerned from Chapter 6's Diagram 2. Comparison of the age group 15 through 17 for the three cohorts is most difficult because this group is in a different time period in each cohort.

We arbitrarily decided that variation by 10% or more from the mean shown in Table 1 would categorize an area as high or low and that values within 10% of the mean would be considered the middle category. What kind of patterns may be expected if every area of every spatial system for every cohort and each of the four age groups is approached in this way? Some of the possibilities are shown in Diagram 1.

DIAGRAM 1. COHORT AND AGE GROUP PATTERNS OF DELINQUENCY AND CRIME RATES

A. Inner City High Rates

	Age			
Cohort	6-10	11-14	15-17	18-20
1955	H	H	H	H
1949	H	H	H	H
1942	H	H	H	H

B. Inner City or Interstitial Imperfect

1955	H	H	H	H
1949	H	H	H	H
1942	L	M	H	M

C. Transitional - Late

1955	H	H	H	H
1949	M	M	H	H
1942	L	M	M	H

D. Transitional - Early

1955	M	M	M	M
1949	L	L	M	M
1942	L	L	L	M

E. Cohort Transition - Late

1955	H	H	H	H
1949	M	M	M	M
1942	L	L	L	L

F. Cohort Transition - Early

1955	M	M	M	M
1949	L	L	M	L
1942	L	L	L	L

G. Age Group Transition

	Age			
Cohort	6-10	11-14	15-17	18-20
1955	L	M	H	M
1949	L	M	H	M
1942	L	M	H	M

H. Age Group Transition with Adult Careers

1955	L	M	H	H
1949	L	M	H	H
1942	L	M	H	H

I. Middle and High SES

1955	L	L	M	L
1949	L	L	L	L
1942	L	L	L	L

J. Declining Age Group and Cohort

1955	M	L	L	L
1949	H	M	L	L
1942	H	H	M	L

K. Declining by Cohort

1955	L	L	L	L
1949	M	M	M	M
1942	H	H	H	H

L. No Discernable Pattern

1955	H	L	M	H
1949	L	H	L	M
1942	M	L	H	L

Types A and B would be the expected pattern for inner city and interstitial areas, B being essentially the same as A but allowing for some chance variation in where an age group for a particular cohort might fall, particularly if there were few persons from the cohort in that age group in that area. Also, persons in the age group 11 through 14 in the 1942 Cohort would have been in the area (assuming that it was in transition) when it had "better" characteristics than it had when those from the 1949 and 1955 Cohorts resided there. Similarly, persons 15 through 17 from the 1942 Cohort in an area were there at one time period, those from the 1949 Cohort during the next time period, and those from the 1955 Cohort during the last time period when the area had completely changed. Table 2 may clarify the point, time periods appearing in each segment of the Cohort/Age Group model. Thus, there might be a medium or even a low score in several of the earlier time periods (lower boxes) of an area that has completed the transition from an older, stable residential area to one that is more or less deteriorated.

Type C is a model for an area in transition. Cohort by cohort it has higher rates than the city as a whole and continuity in careers is developing there, i.e., even if the earlier years produced rates lower than or essentially the same as those in the city, they became higher in the later years. Considering the general change in cohorts and the time period phenomenon, this type, with the probability of some chance variation should (if the overall transition model is correct) be

TABLE 2. RELATIONSHIP OF TIME PERIODS TO COHORTS AND AGE GROUPS

	Age Groups			
Cohort	6-10	11-14	15-17	18-20
1955	1960-69 1961 →	1960-69	1970+	1970+ → 1976
1949	1950-59 1955 →	1960-69	1960-69	1960-69 → 1974
1942	1950-59 1948 →	1950-59	1950-59	1960-69 → 1974

found for all interstitial areas and those which are developing outside the city core because of commercialization and industrialization. Type D is similar but not as far along in transition.

There are, of course, areas that are more stable and, while delinquency and crime rates increase at every age, the career type of involvement has not become a characteristic of the area. These should produce an even different picture. Types E and F are the patterns to be expected where the only variation from the city's rate is cohort increase. Some deviation from this pattern might be expected if the change was more pronounced for those in the 11 through 14 and especially the 15 through 17 age groups.

Another pattern which must be considered is one in which there has been little cohort to cohort change but there has been an increase in rates by age groups, at least to the 15 through 17 group. This pattern should appear similar to G and H. A large proportion of the middle and upper socioeconomic status areas will have a pattern similar to I, all rates at all ages and all cohorts lower than those for the city. There will, of course, be some areas in which the pattern is one of decline, J and K.

Some areas will show no pattern, in many cases because the few persons in the area are non-representative. Police contact patterns will now be considered, followed by seriousness, referrals, and sanctions.

CHANGING PATTERNS OF POLICE CONTACTS

When the rates for the three measures of police contact were inspected it was found that three of the four inner city census tracts had patterns A or B for each measure. There were too few cohort members in the fourth tract, the central business district, to characterize it according to the model. Only one of the transitional tracts showed cohort increase, type E. Tract 2 did not fit any type, probably because it was very heterogeneous and had gone through a more complex type of transition, changing from middle and high socioeconomic status to a university housing and lower socioeconomic status area with evidence of this in the high frequency of contact for the 1949 Cohort but low frequency rates for the 1955 Cohort. The remainder of the tracts fit other patterns or none at all but they did not fit the patterns expected for inner city and interstitial areas. The classification of each census tract may be found in the first column of Table 3. The classification of each area in each spatial system is shown in this table and it may be referred to as the discussion progreses.

The findings were similar for police grid areas, two of the four inner city areas falling in type A and the two others, while generally above the city's rates, neither followed the inner city or transitional pattern closely enough to be classified as such nor could be placed in another type. Only one of the three transitional areas was a close fit to an appropriate transitional delinquency and crime pattern. On the other hand, only one of

TABLE 3. COHORT AND AGE GROUP PATTERNS OF DELINQUENCY AND CRIME FOR POLICE CONTACTS, SERIOUSNESS SCORES, REFERRALS, AND SANCTIONS[1]

CENSUS TRACTS					POLICE GRID AREAS					NATURAL AREAS					NEIGHBORHOODS					
	CO[2]	SE	RE	SA		CO	SE	RE	SE		CO	SE	RE	SA		CO	SE		CO	SE
Inner City																				
3	A	A	B	C	8	L	E	E	C	1	A	B	B	C	17	L	L	12	A	B
4	B	B	E	C	12	A	B	A	E	2	A	A	A	B	8	E	E	9	B	B
5	A	A	B	B	13	A	A	B	L	3	L	L	L	I	7	A	A	5	D	F
					16	L	B	B	B	4	L	C	C	C	13	A	A	10	L	L
										5	L	B	B	C	61	A	-	11	E	E
															6	B	K	2	A	B
																		3	E	C
Transitional																				
2	L	L	L	L	9	B	B	B	L	6	D	E	E	I	19	C	C	49	C	C
13	E	E	D	C	17	K	J	K	K	8	C	C	H	C	18	L	L	50	E	E
6	K	K	J	I	20	E	F	E	E						16	C	C	54	B	L
7	K	L	K	L											4	L	I	33	L	L
															46	C	C	37	C	C
Stable Residential																				
10	F	F	I	D	14	K	K	K	I	9	L	L	K	G	20	L	H	63	L	I
12	L	K	K	I	18	K	C	G	C	10	I	I	L	L	21	I	I	53	K	K
8	K	K	H	G	4	I	I	I	I	11	K	K	L	I	22	I	L	62	L	L
9	F	L	L	H	21	L	L	L	L	12	L	I	I	I	23	L	L	56	L	I
										13	I	I	I	I	29	I	I	32	K	L
										14	K	K	K	I	31	L	L	35	I	I
										21	I	I	I	I	14	K	K	36	J	J
															15	K	L	34	I	I
Peripheral or Upper SES																				
11	K	K	I	I	5	L	I	I	I	19	F	F	E	E	27	I	I	38	K	K
14	I	I	I	I	6	E	E	E	D	16	I	I	I	I	28	I	K	57	I	I
					15	I	I	I	I	20	K	K	I	I	51	I	I	24	I	I
					19	K	F	I	I	18	K	K	I	I	52	I	I	25	I	I
					22	I	F	F	I	17	K	L	L	L	55	L	I	26	I	I
					23	K	I	I	I	25	I	I	I	I	67	I	-			
					10	I	I	I	I						47	F	F			
					1	I	I	K	H											
					2	I	I	I	I											

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[1] The symbols shown for each area for each variable (from Diagram 3) are a composite of the pattern for percent with contacts, cohort rate, and rate for those with contacts.

[2] CO = Contact rates; SE = Seriousness scores; RE = Referral rates; SA = Severity of sanctions.

the stable or peripheral or upper socioeconomic status areas even approximated the model for inner city and interstitial areas. The evidence from cohorts in police grid areas neither supported the overall model nor presented negative evidence. What we have said about the heterogeneity of grid areas and the manner in which natural areas are divided by them is relevant to these findings.

Having made this point, we would expect more positive findings when the natural areas are inspected. The two largest inner city natural areas (the most inner city) fit pattern A perfectly but none of the others fit any pattern, although all had generally higher rates than those for the city in some cohort and/or age group sequences. By contrast, the two transitional areas which contained persons from each cohort were fairly close to transitional models D and C. Other natural areas either fell into appropriate patterns, approximated them, or fell into no pattern at all. Thus far we have not had strong positive evidence in support of the model from the cohort police contact data.

Neighborhoods present a different story. All but two of the 13 inner city areas with persons from each of the cohorts were found in patterns A and B or the transitional patterns D and E. Seven of the 10 interstitial neighborhoods could be placed in one of the transitional patterns. One of those which could not was the university area which we have previously mentioned and another had some elements of cohort transition but did not fit the pattern sufficiently well.

CHANGING PATTERNS OF SERIOUSNESS OF REASONS FOR POLICE CONTACT

Having addressed the problem of changing patterns of police involvement by persons in each of the cohorts, we turn to the same kind of, but not such an extensive, examination of seriousness of reasons for police contact. This may be more cursory because the general pattern of change has been described in such detail.

Age group and cohort seriousness trends for the entire city are shown in Table 4. The mean seriousness scores for each cohort and age group were examined for each area in each spatial system and again characterized as high, medium, or low, depending on the direction it fell from 10% of the mean of the city for that group. Each pattern of highs, mediums, and lows was in turn characterized according to the models presented in Diagram 1. The trend of averages was also taken into consideration to be sure that we were aware of trends in seriousness even though they might not be sufficiently above or below the city averages to be captured by this analytic technique.

Although seriousness for the cohorts and seriousness by age group followed a gradual transition that is consistent with other findings, the seriousness pattern for only those who had had contacts with the police did not produce such a neat pattern but was consistent with our earlier findings that seriousness of reasons for offenses methodically increases through each age group for relatively few persons, as shown in Table 5. Some areas were characterized in the same way following both

TABLE 4. AGE GROUP AND COHORT VARIATION IN MEAN SERIOUSNESS SCORES

	Age Group			
Cohort	6-10	11-14	15-17	18-20
1955	.69	2.64	4.21	3.83
1949	.44	1.65	3.54	3.18
1942	.14	.84	2.84	2.60

TABLE 5. AGE GROUP AND COHORT VARIATION IN MEAN SERIOUSNESS SCORES FOR PERSONS WITH POLICE CONTACTS

	Age Group			
Cohort	6-10	11-14	15-17	18-20
1955	3.4	10.0	10.3	9.3
1949	4.8	6.2	8.4	7.3
1942	3.7	5.2	7.4	7.3

TABLE 6. COMPARISON OF SERIOUSNESS MEASURES: CENSUS TRACT 3

Percent With Police Contacts

Cohort	Age Group 6-10	11-14	15-17	18-20
1955	22.7	43.7	52.6	60.5
1949	12.5	34.8	53.6	59.4
1942	7.5	22.5	42.5	57.7

Cohort Seriousness Scores

Cohort	6-10	11-14	15-17	18-20
1955	2.75	5.51	8.46	11.43
1949	.48	2.90	6.99	7.33
1942	.35	1.20	2.33	5.04

Persons With Contacts Seriousness Scores

Cohort	6-10	11-14	15-17	18-20
1955	12.1	12.6	16.1	18.9
1949	3.8	8.3	13.0	12.3
1942	4.7	5.3	5.5	8.7

characterized by the E pattern, that is, cohort transition. Of the transition grids (9, 17, and 29), 9 was already like the inner city in cohort seriousness. Grid Area 17 was in transition but declining in seriousness by cohort and, to some extent, by age group (J). Grid Area 20 was in the early stage of transition to higher seriousness. All other police grid areas had various patterns with low seriousness predominating except Areas 6, 18, 19, and 22, all of which were far enough along in the process of transition to higher seriousness to come close to pattern C, E, or F. Perusal of the mean seriousness scores revealed, of course, that seriousness did tend to increase from the lower left-hand corner (1942 Cohort, ages 6 through 10) of some areas' overall pattern to the upper right-hand corner (1955 Cohort, ages 18 through 20) but with insufficient regularity or of such a degree as to not trip the coding procedure that would classify them as showing significant transition.

Natural Areas 1 and 2 were close fits to the A or B pattern (Area 2 fitted A perfectly for cohort seriousness) but only two of the three other inner city natural areas (4 and 5) fitted the transitional models. Natural Area 3 did not fit the other patterns either. Inspection of the two areas that should have been in transition (Areas 6 and 8) indicated that Area 6 came closest to D, cohort transition-early, and Area 8 came closest to C, transition-late. In fact, Area 8 was an almost perfect example of a nearly completed transition, differing only in that the mean seriousness scores had not reached as high a level as those in the inner city. This area has mean seriousness scores very similar to those found in Areas 3, 4, and 5 but showed the cohort and age group transition process that was not present in the irregular pattern of predominantly high seriousness scores in the latter. While the reader may say that by and large these areas are similar, that is not the point. This research has posited regularity in the transition process and if an area by its spatial location and other characteristics has been classified as transitional, then its pattern of seriousness scores should change from cohort to cohort and from age group to age group with regularity inasmuch as each cohort's age group moves along in time as well.

Most other natural areas were either in a pattern with low seriousness scores or did not follow a transition pattern to high seriousness scores, with the exception of Area 19 which fell in the early transition pattern F.

We concluded that these spatial systems did not provide negative evidence but were only partially supportive of the hypothesis of orderly transition to higher seriousness patterns.

All but three of the inner city neighborhoods had either high seriousness score patterns or indicated that they were in transition. Neighborhood 6, which had a very high percent of its residents involved with the police and would be placed in the B pattern in that respect, showed a marked decline in seriousness for the 1955 Cohort and was most appropriately placed in pattern K. Neighborhood 3, which was outside the city's official inner city and which did not appear to belong in our inner city area, did show evidence of transition when seriousness scores were considered and thus was placed in C.

All but three of the areas which we had considered in transition for which there were sufficient residents from the cohorts to produce a reliable statistic were in transition to a high seriousness pattern. Neighborhood 4 had very low seriousness scores, as did Neighborhood 33. Of the remaining neighborhoods, none of which should have had high seriousness scores or a pattern of transition to them, Neighborhoods 20 and 47 showed some evidence of transition to high seriousness scores.

We again concluded that the relative homogeneity of neighborhoods facilitates the delineation of areas in which persons reside whose contacts with the police are for more serious reasons, even if the patterns of transition which we proposed do not characterize the areas as neatly as hypothesized. Whatever their pattern of seriousness, there are few neighborhoods within the inner city and transitional areas with many low mean seriousness scores in age group/cohort segments of their pattern and few middle and high SES neighborhoods with many high mean seriousness scores in their patterns.

CHANGING PATTERNS OF POLICE REFERRAL

Having had a contact with the police, one of several things may happen to the juvenile or adult depending on the seriousness of the reason for the contact, the area of the community, the characteristics of the alleged offender, including demeanor at the time of contact, the reason that the officer made the contact, i.e., did the officer see the actor do it or was the officer answering a complaint that had been communicated from the police station, the characteristics of the complainant if known to the officer, the time of day or night, the general policy of the police department on street-level handling rather than referral, the officer's receptivity to departmental policy and, of course, the overall attitude of the officer toward miscreants encountered on patrol.[1] Although we have a considerable amount of official data describing the circumstances of police contacts and interview data about respondents' perceptions of their contacts with the police and what happened, it is very possible that variation within the areas of each spatial system would be so great on something as complex as this that little would be added to our understanding of how the referral phenomenon varies within each spatial system.

It should suffice for our purposes to determine if those who reside in the inner city and interstitial areas are more likely to be referred than are those who reside in other areas and if this pattern is changing. We are also concerned about the average number of referrals per person in each area and the average number of referrals for those who have at least one referral.

Since persons living in those areas in which a larger proportion of the cohort has police contacts and in which the mean number of police contacts is high have a greater probability of referral, these statistics should result in separation of the inner city and interstitial areas even more clearly than did contacts and seriousness scores. Even if seriousness of reason for police contact is not the only deciding factor in the decision to refer, research has shown it to be so important that the referral pattern for each area should place it in essentially the same category as did average seriousness.

The percent of those who have been referred in Racine, the mean number of referrals for persons with referrals, is shown in Table 7 by age group and cohort. Inner city Tracts 3, 4, and 5 had referral rates and age group/cohort patterns which again sharply differentiated them from other tracts. Referral rates showed some cohort decrease in Tract 2 but it could not be placed in a pattern. Tract 13 fell in D, transition-early, the only tract of this nature. Tract 8 had some of the pattern of a transition tract but not enough to place it in that category, pattern H (age group transition) being more appropriate. All other tracts had generally lower referral rates and even if the proportion of their youth 15 through 17 was similar to that of tracts closer to being in transition, their referral pattern was closest to the generally low rate pattern or cohort decline, or fitted no pattern.

All of the inner city police grid areas were either characterized by relatively high referral statistics for all cohorts or had made the transition to high proportions with referrals and high mean numbers of referrals. Grid Area 9 was in

TABLE 7. PERCENT OF COHORT REFERRED, MEAN NUMBER OF REFERRALS PER PERSON, AND MEAN NUMBER OF REFERRALS PER PERSON WITH REFERRALS BY AGE GROUP AND COHORT

Percent of Cohort Referred

Cohort	6-10	11-14	15-17	18-20
1955	.6	10.3	23.3	18.2
1949	.7	4.1	23.8	16.6
1942	.8	4.5	20.8	15.9

Mean Number of Referrals Per Cohort Member

Cohort	6-10	11-14	15-17	18-20
1955	.01	.32	.66	.43
1949	.01	.07	.51	.33
1942	.01	.05	.37	.29

Mean Number of Referrals Per Cohort Members with Referrals

Cohort	6-10	11-14	15-17	18-20
1955	2.2	3.1	2.8	2.4
1949	1.0	1.6	2.1	2.0
1942	1.0	1.1	1.8	1.8

transition, 17 was characterized by cohort decline in referrals, and 29 showed evidence of transition. Grid Area 18, although not generally a problem area, had a relatively higher proportion of its juveniles aged 15 through 17 referred from each cohort than expected and had relatively high referral rates for this group from every cohort. It was an anomaly in this respect and possibly indicative of concern for younger juveniles disproportionately to other age groups in the area. Grid Areas 6 and 22, both peripheral, were in the transition stage.

Natural Areas 1, 2, and 5 were consistently above the other areas on every measure of referrals followed by Area 4, which was in transition. Natural Area 3 did not follow the expected pattern even though it has been considered part of the larger inner city area and its 1955 Cohort has been comparable to other inner city cohorts in some respects. Even transitional Areas 6 and 8 were more similar to the inner city areas than was Area 3.

Only one of the other natural areas (9) had a pattern of referral statistics which suggested that it was in transition in this respect. In fact, most had relatively low rates for all cohorts in most age groups. Natural Area 6, which we have already mentioned and which contained much of the Revitalization Area, also showed evidence of high referral rates for youth aged 15 through 17 in the 1955 Cohort. Since this area is thought of as a demonstration area, it may well be that the high referral rate for this group should be considered evidence of either greater community concern for youth in the neighborhood or greater concern for the neighborhood.

Because referral statistics involve diminishing numbers we shall not go into a discussion of neighborhood differences on these statistics, although the tables are available. It became fairly obvious in the course of examining the multitude of tables produced that at each step from police contacts to seriousness of contacts to referrals, the inner city and interstitial areas differed more and more from other areas and that there had also been an increasing focus on youthful offenders.

CHANGING PATTERNS OF COURT SANCTIONS

Assuming that the apparent focus of attention on youthful offenders continues one step further we would expect even more distinct differences between inner city and interstitial areas and other areas in the community when severity of sanctions scores are considered. Since a very small proportion of those at the ages 6 through 10 were sanctioned, the table showing percent of the cohort sanctioned and mean severity of sanctions scores may be reduced to three age groups (see Table 8). The sharp jump in the percent of those who had been sanctioned between the 1949 and 1955 Cohorts is immediately noted, as is the increase in severity of sanctions scores when averaged for all cohort members.

Findings for inner city Tracts 3, 4, and 5 paralleled those from previous measures with these tracts either characterized by relatively high percentages of their members sanctioned, high average severity of sanctions scores for the cohort, and high average severity of sanctions scores for those who received them

TABLE 8. PERCENT OF COHORT SANCTIONED AND MEAN SEVERITY OF SANCTIONS FOR COHORT AND PERSONS WITH SANCTIONS

Percent with Sanctions

	Age Group		
Cohort	11-14	15-17	18-20
1955	5.1	21.8	23.9
1949	.5	3.9	15.2
1942	.4	3.5	13.1

Mean Severity of Sanctions for Persons in Cohort

	Age Group		
Cohort	11-14	15-17	18-20
1955	.44	1.85	2.37
1949	.08	.58	1.67
1942	.05	.47	1.30

Mean Severity of Sanctions for Persons with Sanctions

	Age Group		
Cohort	11-14	15-17	18-20
1955	8.9	9.9	11.4
1949	16.2	14.7	11.0
1942	13.5	13.5	9.9

or by almost complete transition to this status. Tract 13 was in transition, as was Tract 10. Tracts 8 and 9 also showed evidence of becoming more like the inner city tracts.

The consequences of this are problematic in reference to our major hypothesis that delinquency and crime areas move outward from the inner city with population movement and change in the organization of society. It does appear that concern with youthful offenders has resulted in comparatively more juveniles being sanctioned than would be expected from the 1955 Cohort from some areas considering the comparative position of these areas on the measures of contacts and severity of reasons for contact. An example from the 1955 Cohort for the 15-17 age group for two different tracts is presented in Table 9.

The percent with police contacts is similar for both tracts but the mean seriousness of reasons for contact for the cohort is twice as great in inner city Tract 3 as in peripheral Tract 9. The percent with referrals differs, as one would expect considering the seriousness difference. However, the percents with sanctions differ little. The mean severity of sanctions score for the cohort and the mean severity of sanctions score for those who have been sanctioned indicates that severity of sanctions is fairly proportional to seriousness. It is a matter of whether or not some age groups in some areas receive "special attention" because they have been defined as problems. Since severity of sanctions scores have been found to be related to greater seriousness of subsequent reasons for contact, then a

TABLE 9. TRACT VARIATION IN SEVERITY OF SANCTIONS

1955 Cohort Age 15-17	% With Contacts	Mean Seriousness		% With Referals	Mean No. Referals	% With Sanctions	Mean Severity of Sanctions	
		Cohort	W/Contacts				Cohort	W/Sanctions
Tract 3	42.5	8.4	16.1	35.5	1.6	28.9	3.86	13.3
Tract 9	38.9	4.2	10.2	28.1	.7	26.3	2.08	7.9

changing pattern of severity of sanctions could have an impact on increasing delinquency and crime.[2]

Police grid areas in the inner city, Areas 8, 12, and 16, were in various transitional stages on the sanctions measures, as was 20. Two other areas, 18 and 6, had transition patterns. Of the inner city Natural Areas, all but Area 3 fit a transition model. Natural Area 6, the revitalization area, showed no evidence of transition to the inner city pattern but Area 8, a heavily commercialized, peripheral area congruent with Grid Area 18, was an excellent example of the transition type. Area 19, which had some of the characteristics of Area 8, was in the transition process. Other areas had low rates in most age period/cohort groups and, if they did not, failed to fit one of the models that have been presented.

CONCLUSION

We concluded: 1) that age group/cohort sanctions patterns do not coincide perfectly with other contact, seriousness, and referral patterns for the inner city and interstitial areas when, in fact, they should be a logical outgrowth of them; 2) that concerns about the problems of juvenile delinquency and youthful crime have led to the application of more severe sanctions in the most recent time period to juveniles in the late teen-age group (an age group emphasis on severity of sanctions as a deterrent to future criminality); 3) that this has resulted in the disproportional involvement of juveniles with the justice system from some areas outside the inner city and interstitial areas; 4) that deviations from the transition model for other measures of delinquency and crime may be fostered by changes in the social organization of the city as manifested in the changing characteristics of areas; and 5) that the cyclical nature of events in the justice system (the consequences of sanctions on future behavior) has probably played a part in creating deviations from the inherently spatial nature of the expected pattern of contacts and seriousness of offenses from cohort to cohort and age group to age group.

FOOTNOTES

[1] The question of differential referral rates among members of the three Racine cohorts has been dealt with at length in Chapter 10, "Differentials in the Referral of Police Contacts and Their Use in Predicting Continuity," _Assessing the Relationship of Adult Criminal Careers to Juvenile Careers_. Final report to the National Institute of Juvenile Justice and Delinquency Prevention, Department of Justice, August 1980, 950 pp. multilith. Also see: Lyle W. Shannon, "A Longitudinal Study of Delinquency and Crime," Chapter 7, Charles Wellford (ed.), _Quantitative Studies in Criminology_, Beverly Hills: Sage Publications, 1978, pp. 121-146. The Racine research has led us to agree with Edward Green, "Race, Social Status and Criminal Arrest," _American Sociological Review_, Vol. 35, 1970, pp. 476-490, who concludes, "...the high official rate of crime for Negroes as compared with whites results predominantly from the wider distribution among Negroes of lower class characteristics associated with crime." Although the question of race/ethnic effects has not been of paramount concern in this analysis, to the extent that place of residence (inner city and interstitial areas) is an indicator of social class, it is apparent that race/ethnicity and social class combine to produce a referral rate for Blacks that is higher than that which they would obtain from place of residence alone.

[2] Some indication of the negative effects of processing, particularly for White males, has been found by Suzanne S. Ageton

and Delbert S. Elliott, "The Effects of Legal Processing on Delinquent Orientations," Social Problems, Vol. 22, 1974, pp. 87-100.

Chapter 8. Spatial Continuity in Delinquency and Crime: The Hardening of the Inner City

CHANGE IN PERCENT WITH POLICE CONTACTS BY AGE

In chapter after chapter we have noted what appears to be stability over time or continuities in delinquency and crime rates in the inner city at the same time that these rates are also increasing in some interstitial and outlying areas. Further understanding of this process may be obtained by considering the percent of those who have had at least one police contact on an age-by-age basis for those residing in different types of areas, inner city, transitional, etc.

Because persons on the firing line do look at annual statistics and are concerned about annual trends in the behavior of people by place of residence and, even more important, by recognized neighborhoods, the cohort data were analyzed on this basis for each of the spatial systems. Examination of these data for census tracts for each cohort and each age reveals a more or less gradual but steady chronological increase in the percent of persons who have had a contact, moreso in some tracts than in others. For example, for the 1949 Cohort in Tract 5 the percent with contacts increased from the age of 6 (2.0%) to the age of 16 (30.7%) and from there on to the age of 24 at a level which moves up and down no more than 8%. Similar patterns of progression are found for <u>other</u> inner city tracts, grids, and natural areas. While the highest proportion of persons from the 1955 Cohort with a police contact from any tract at age 19 was 38.2% (Tract 3), the highest proportion from a police grid area was 40.7% (Grid Area 12), the highest proportion from a natural area was 37.8% (Natural Area 2), and the highest proportion from a neighborhood was 51.6% (Neighborhood 12), a neighborhood within Natural Area 2. The regularity of progression in percent of those who resided in any area was related, of course, to the number of persons residing in the area (progression percentages were smoother from year to year for areas with large populations) so that even though most neighborhoods had a peak proportion of their cohort members involved with the police in the late teens, trends for neighborhoods within cohorts and cohort comparisons were more difficult to specify.

What one could note, although it only reinforces findings from the aggregated data previously presented, is that the inner city Tracts 3, 4, and 5 showed early involvement of persons in each cohort, reaching the point that 30% or more of the cohort was having police contacts each year by the age of 16 or 17. This level of involvement continued with some fluctuation so that by the ages of 30 or 31 for the 1942 Cohort, 24 for the 1949 Cohort, and 21 for the 1955 Cohort approximately 30% or more of each cohort residing in these areas was still having at least one police contact per year. This pattern was found in no other census tract.

For those from the 1942 Cohort who resided in inner city Police Grid Areas 8, 12, and 16 a high and continuing level of involvement was found, although Area 16 showed a decline in the proportion with annual police encounters by the age of 27. The 1949 Cohort presented essentially the same pattern of year by year progression for these areas but Grid Area 13 could now be added to those with continuity and high involvement with the police. The 1955 Cohort showed a similar pattern for all of these areas but to it could now be added Area 9. It was also apparent by this time that Areas 5, 6, 17, 18, and even peripheral Area 22, were areas with continuity and relatively high police involvement on the part of cohort residents. The police grid area tables for each cohort suggested that these changes were related to both cohort and time period progression.

Persons from the 1942 Cohort who resided in Natural Area 2 showed an early involvement and progression through the age of 31 unmatched in any other area. From the age of 17 at least 40%, give or take 5% of the people who resided there, had at least one police contact every year until they reached the age of 28 and, of those who still resided in the area after that, involvement was as high as 70% at the age of 30. Among the 1949 Cohort residents of Natural Area 1, the pattern was similar to that for Natural Area 2. It was also apparent that early and widespread involvement and continuity was becoming the pattern for Natural Areas 4, 5, and 8. While several other areas had relatively earlier and widespread involvement, continuity into adulthood for a large percent of the group was still not the pattern. However, the 1955 Cohort showed that early involvement and continuity was becoming the pattern for a larger proportion of the young people in not only the areas that we have mentioned for the 1942 and 1949 Cohorts but for those from many areas bounding the inner city and interstitial areas as well.

The most extreme example in the 1942 Cohort was Neighborhood 9 where at the ages of 18 and 19 over 70% of the youth had at least one police contact and had high involvement through the age of 26 for its young adults. While the involvement of persons who resided in Neighborhood 9 was one of the highest in the 1949 Cohort (although less than for the 1942 Cohort), there were others with comparably high involvement and for the 1955 Cohort there were even more neighborhoods with as high or higher involvement than that of Neighborhood 9. This does not mean that Neighborhood 9 was undergoing a decline in its youthful crime rate but that the 1955 Cohort was not contributing as large a proportion to the overall rate for the area as had some previous cohorts at their age of high involvement.

Neighborhood data make it possible to pinpoint areas which showed little involvement of cohort residents at early ages but which at a later period and for another cohort displayed high involvement. When these changes are congruent with changes in the distribution of targets and other change in the neighborhood, as in the case of Neighborhood 46, we can see how increasing youthful involvement with the police is part of a larger transitional process that may be captured with units of observation smaller than census tracts and police grid areas, even though there are analytic problems involved when too few members of cohorts are found in some areas. At the same time, however, it must be made clear that we are not talking about individual continuity, a different matter which has already been dealt with elsewhere at considerable length.[1] The proportion of the members of any cohort who have continuity has been shown to be relatively small, although higher in the inner city than in other areas. These data simply tell us that a larger proportion of the persons who reside in inner city areas are continuously generating police contacts than are those from other areas.

SPATIAL CONTINUITY IN SERIOUSNESS

The mean seriousness scores for cohort members residing in each area of each spatial system were correlated, age group by age group, in further assessment of the trend toward hardening of the inner city, as shown in Table 1. Although prior analyses have shown that individuals have limited continuity from age group to age group, such continuity that does exist is greatest between adjacent age groups. We are here concerned about the extent to which seriousness has continuity in an area regardless of which members of the cohort reside there and would expect adjacent age groups to show the greatest continuity.

This is not entirely the case for the 1942 Cohort, whichever spatial system is utilized, although relatively high correlations of seriousness scores are obtained for the earliest two age groups regardless of the spatial system. This may be because seriousness scores were lowest for the 1942 Cohort so that movement by some of its more troublesome members could have

TABLE 1. CORRELATION OF AGE GROUP AND AREA MEAN SERIOUSNESS SCORES BY COHORTS

	Ages 6-10 x 11-14	Ages 6-10 x 15-17	Ages 6-10 x 18-20	Ages 11-14 x 15-17	Ages 11-14 x 18-20	Ages 15-17 x 18-20
Census Tracts:						
Cohorts						
1942	.7630	.1948	.6926	.2802	.5278	-.0396
1949	.7137	.5705	.5194	.8663	.8773	.8714
1955	.6906	.7734	.8573	.8270	.7913	.9151
Police Grids:						
Cohorts						
1942	.6910	.3025	.1241	.7619	.2632	.1441
1949	.8255	.6783	.6901	.8955	.8547	.9217
1955	.6523	.4453	.4000	.7148	.4573	.6908
Natural Areas:						
Cohorts						
1942	.6890	.1166	.5407	.4295	.3200	.0485
1949	.5651	.5830	.4558	.8741	.7990	.8912
1955	.6789	.5910	.6696	.8204	.7274	.7338
Neighborhoods						
Cohorts						
1942	.7297	.3445	.2624	.5182	.1106	.2657
1949	.7260	.7540	.6456	.8842	.7967	.8098
1955	.6722	.5662	.6335	.5920	.6429	.8135
1942 Cohort:						
Tracts	.7630	.1948	.6926	.2802	.5278	-.0396
Grids	.6910	.3025	.1241	.7619	.2632	.1441
Nat. Areas	.6890	.1166	.5407	.4295	.3200	.0485
Neighbhds.	.7297	.3445	.2624	.5182	.1106	.2657
1949 Cohort:						
Tracts	.7137	.5705	.5194	.8663	.8773	.8714
Grids	.8255	.6783	.6901	.8955	.8547	.9217
Nat. Areas	.5651	.5830	.4558	.8741	.7990	.8912
Neighbhds.	.7260	.7540	.6456	.8842	.7967	.8098
1955 Cohort:						
Tracts	.6906	.7734	.8573	.8270	.7913	.9151
Grids	.6523	.4453	.4000	.7148	.4573	.6908
Nat. Areas	.6789	.5910	.6696	.8204	.7274	.7338
Neighbhds.	.6722	.5662	.6335	.5920	.6429	.8135

considerable impact on the mean seriousness scores of smaller areas or simply because the inner city had not yet stabilized or hardened to such an extent that its average seriousness scores were always so high in contrast to other areas that the high correlations found at the earliest ages would continue. Inspection of the mean seriousness scores suggests that it is a combination of these factors. The 1949 Cohort has relatively high correlations between seriousness scores across age groups at almost every point expected and some high correlations for nonadjacent age groups. The 1955 Cohort likewise has high correlations at almost every point expected (between adjacent age groups) and at some other points as well.

Perhaps more important is the fact that age groups 11 through 14, 15 through 17, and 18 through 20 almost always have the highest correlations for the 1949 and 1955 Cohorts. This becomes even more apparent by referring to the bottom three segments of the table where the same correlations are arranged by cohorts. These correlations suggest, as have other analyses, that persons who reside in high delinquency and crime areas are being influenced by their milieus, particularly during the 1960s and 1970s, the time periods encompassing the 1949 and 1955 Cohort ages from 11 through 20. These data are not presented as any final evidence but only as additional supportive evidence to what appears to be a process of stabilization of rates or what we have referred to as the hardening of the inner city.

Let us go a step further. If seriousness scores for earlier ages are regressed on seriousness scores for the 18 through 20 age group for each spatial system, will we find a progressive impact suggestive of hardening through time? The results are shown in Table 2. For both the 1949 and 1955 Cohorts we find that the 15 through 17 mean seriousness scores of areas have a significant impact on the 18 through 20 mean seriousness scores, regardless of the spatial system considered. There were no significant effects for the 1942 Cohort. When the 11 through 14 age group is inserted during the second step, significant effects are still lacking for the 1942 Cohort with some changes for the 1949 and 1955 Cohorts. Still, the 15 through 17 age group accounts for the mean seriousness scores of areas during ages 18 through 20 in three of four spatial systems. Inserting the 6 through 10 age group in the next step results in very little change and we conclude that the mean seriousness of most recent prior age group for persons residing in an area accounts for more of the 18 through 20 seriousness of reasons for police contacts in areas than does seriousness of other age groups.

THE CONSEQUENCES OF MOVEMENT

There has been considerable concern over the years about whether delinquent neighborhoods generate continuities in delinquency and crime or whether crime-oriented young adults gravitate to more crime-oriented neighborhoods as they leave their homes.[2] This, like many other propositions, could be resolved in a definitive manner with the cohort data if it were

TABLE 2. REGRESSION OF SERIOUSNESS SCORES BY AGE GROUP AND PLACE OF RESIDENCE DURING JUVENILE YEARS ON SERIOUSNESS SCORES DURING YOUNG ADULT PERIOD

Dependent Variable: Seriousness 18-20	1942 COHORT				1949 COHORT				1955 COHORT			
	Tract	Grid	Nat. Area	Neigh-borhood	Tract	Grid	Nat. Area	Neigh-borhood	Tract	Grid	Nat. Area	Neigh-borhood
R	-.040	.144	.049	.266	.871	.922	.891	.810	.915	.691	.734	.813
Adjusted R^2	.000	.000	.000	.046	.737	.838	.783	.648	.824	.448	.513	.655
Beta Age 15-17	-.040	.144	.049	.266	.871*	.922*	.891*	.810*	.915*	.691*	.734*	.814*
Multiple R	.563	.277	.335	.268	.905	.924	.892	.828	.917	.693	.766	.838
Adjusted R^2	.165	.000	.001	.020	.783	.829	.772	.672	.812	.419	.538	.689
Beta Age 15-17	-.204	-.134	-.109	.285	.446	.789*	.817*	.483*	.825*	.744*	.419	.667*
Age 11-14	.585	.366	.367	-.037	.491	.148	.085	.370*	.109	-.075	.384	.248*
Multiple R	.716	.310	.546	.387	.913	.926	.896	.828	.945	.710	.797	.847
Adjusted R^2	.330	.000	.158	.077	.779	.818	.766	.665	.862	.411	.567	.700
Beta Age 15-17	-.189	-.251	.027	.304	.413	.822*	.857*	.467*	.591*	.753*	.388	.603*
Age 11-14	.058	.605	-.118	-.346	.647	.029	.110	.361	.050	-.214	.205	.157
Age 6-10	.685	-.218	.619	.411	-.177	.109	-.106	.032	.366*	.205	.302	.177

* F-value indicates significance at .05 level or less.

our main concern because sequences of contact, referral, and cohort sanctions may be ascertained for each person in each cohort. Tables 3 through 5 present the results by census tracts, police grid areas, and natural areas.

If the milieus to which members of a cohort moved were ones which had been assessed as more delinquency and crime producing (a lower SES area) than the ones which they had left, it would be expected that those who changed milieu would have had increased involvement with the police and courts. Mean number of contacts for cohort members, persons with contacts, mean seriousness scores for cohort members, and so on, were calculated for those who stayed, those who moved up, and those who moved down. The mean score for those who moved down was usually higher during the following ages than for those who stayed or moved up but this did not mean that the move had had a proportionately greater impact on them than the effects of staying in the same type of area had on others.

In order to determine whether or not a proportionately greater impact was there for those who moved down, an impact that would override whatever already acquired characteristics were present in the group who moved down, the after-move mean was divided by the before-move mean. Were the hypothesis of changing milieu effects correct, then the ratio should be lower (the figures in the tables should be higher for those who moved down than for those who moved up) for those who moved to lower SES areas than for others--although this ratio might not be lower

TABLE 3. RATIO BETWEEN MEAN SCORES DURING TWO DIFFERENT AGE PERIODS FOR PERSONS WHO LIVED IN THE SAME TYPE OF CENSUS TRACT BOTH PERIODS AND WHO MOVED TO A HIGHER OR LOWER SES TRACT

		Contacts	Persons w/Contacts	Seriousness	Persons w/Sanctions	Referrals	Persons w/Referrals	Severity of Sanctions	Persons w/Sanctions
1942 COHORT									
Moved 1950-59[1]	Stayed	1.967	1.393	1.752	1.241	1.679	1.457	4.207	1.031
Ages 18-27	Higher	2.053	1.481	2.025	1.461	2.026	1.858	9.327	1.398
÷ 6-17	Lower	1.560	1.248	1.679	1.343	1.532	2.230	7.202	2.057
Moved 1960-69	Stayed	.549	.953	1.250	2.173	.468	.964	.191	.412
Ages 28-34	Higher	.253	.541	.242	.480	.158	.535	.213	.408
÷ 18-27	Lower	.295	.505	.335	.574	.205	.716	.566	1.194
1949 COHORT									
Moved 1950-59	Stayed	19.476	2.853	18.115	2.645	--	2.851	--	7.617
Ages 11-20	Higher	13.133	2.351	12.288	2.196	--	2.377	--	--
÷ 6-10	Lower	30.969	4.064	26.948	3.543	--[2]	--	--	--
Moved 1960-69	Stayed	.541	.701	.552	.716	.504	.876	.928	1.023
Ages 21-27	Higher	.324	.566	.310	.542	.282	.685	.418	.584
÷ 11-20	Lower	.502	.738	.506	.742	.417	.701	.780	.821
1955 COHORT									
Moved 1960-69	Stayed	2.770	1.372	2.837	1.405	3.937	1.204	12.485	1.977
Ages 15-22	Higher	2.410	1.410	2.465	1.441	2.976	.924	15.373	1.837
÷ 6-14	Lower	1.482	.768	1.574	.815	1.987	.695	5.787	1.307

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[1] Mean scores on any variable for the age period 18-27 (time period 1950-59) are divided by mean scores for the age period 6-17 (time period 1960-69) to determine if the latter period scores are relatively higher for persons who moved to lower SES tracts, as would be expected. Only those ratios which indicate a higher relative increase for persons who moved to lower rather than upper SES tracts are underlined solid. However, for those who moved down, the mean score during the following age period was usually higher than that for the mean of those who stayed or moved to a higher SES tract. These cases are underlined dashed. Thus, those who moved down usually had a mean score that was higher than others during the next period even if the increase was not disproportionately greater.

[2] There were either no referrals or sanctions or so few that a ratio could not be computed for the age period 6-10. However, in each of these cases the mean referrals or sanctions for the age period 11-20 were much higher for those who moved to lower SES areas than for those who stayed or moved to higher SES areas.

TABLE 4. RATIO BETWEEN MEAN SCORES DURING TWO DIFFERENT AGE PERIODS FOR PERSONS WHO LIVED IN THE SAME TYPE OF POLICE GRID AREA BOTH PERIODS AND WHO MOVED TO A HIGHER OR LOWER SES GRID

		Contacts	Persons w/Contacts	Seriousness	Persons w/Sanctions	Referrals	Persons w/Referrals	Severity of Sanctions	Persons w/Sanctions
1942 COHORT									
Moved 1950-59[1]	Stayed	2.129	1.515	1.964	1.398	1.859	1.670	6.043	1.422
Ages 18-27	Higher	1.514	1.207	1.340	1.068	1.055	1.205	6.643	.767
÷ 6-17	Lower	2.254	1.933	2.402	1.765	2.141	2.257	5.548	1.850
Moved 1960-69	Stayed	.321	.594	.350	.648	.364	.821	.345	1.035
Ages 28-34	Higher	.252	.496	.243	.478	.212	.637	.227	.453
÷ 18-27	Lower	.660	.903	1.748	2.376	.276	.531	.264	.482
1949 COHORT									
Moved 1950-59	Stayed	21.110	3.056	19.646	2.897	--	2.789	--	7.009
Ages 11-20	Higher	12.751	1.897	10.791	1.604	--	2.370	--	--
÷ 6-10	Lower	47.750	4.754	42.349	4.232	--[2]	--	--	--
Moved 1960-69	Stayed	.506	.675	.511	.683	.463	.819	.792	.864
Ages 21-27	Higher	.371	.642	.356	.615	.271	.803	.526	.780
÷ 11-20	Lower	.559	.780	.570	.795	.509	.719	.780	.802
1955 COHORT									
Moved 1960-69	Stayed	2.583	1.257	2.624	1.276	3.460	1.050	11.018	1.798
Ages 15-22	Higher	2.855	1.566	3.044	1.670	4.003	1.169	16.949	2.117
÷ 6-14	Lower	2.440	1.220	2.464	1.232	3.703	1.346	20.143	3.726

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[1] Mean scores on any variable for the age period 18-27 (time period 1950-59) are divided by mean scores for the age period 6-17 (time period 1960-69) to determine if the latter period scores are relatively higher for persons who moved to lower SES grids, as would be expected. Only those ratios which indicate a higher relative increase for persons who moved to lower rather than upper SES grids are underlined solid. However, for those who moved down, the mean score during the following age period was usually higher than that for the mean of those who stayed or moved to a higher SES grid. These cases are underlined dashed. Thus, those who moved down usually had a mean score that was higher than others during the next period even if the increase was not disproportionately greater.

[2] There were either no referrals or sanctions or so few that a ratio could not be computed for the age period 6-10. However, in each of these cases the mean referrals or sanctions for the age period 11-20 were much higher for those who moved to lower SES areas than for those who stayed or moved to higher SES areas.

TABLE 5. RATIO BETWEEN MEAN SCORES DURING TWO DIFFERENT AGE PERIODS FOR PERSONS WHO LIVED IN THE SAME TYPE OF NATURAL AREA BOTH PERIODS AND WHO MOVED TO A HIGHER OR LOWER SES NATURAL AREA

		Contacts	Persons w/Contacts	Seriousness	Persons w/Sanctions	Referrals	Persons w/Referrals	Severity of Sanctions	Persons w/Sanctions
1942 COHORT									
Moved 1950-59[1]	Stayed	1.891	1.296	2.317	1.150	1.629	1.333	5.345	1.204
Ages 18-27	Higher	1.825	1.362	1.813	1.353	1.733	2.012	5.824	1.294
÷ 6-17	Lower	2.239	1.941	2.317	2.008	2.116	2.398	4.635	1.030
Moved 1960-69	Stayed	.515	.885	1.129	1.938	.326	.786	.240	.480
Ages 28-34	Higher	.271	.481	.259	.449	.228	.728	.206	.449
÷ 18-27	Lower	.295	.664	.390	.878	.296	.847	.655	1.310
1949 COHORT									
Moved 1950-59	Stayed	18.475	3.001	17.227	2.791	--	3.031	--	8.405
Ages 11-20	Higher	16.089	2.072	14.589	1.884	--	2.100	--	--
÷ 6-10	Lower	38.838	4.565	37.294	4.389	--[2]	--	--	--
Moved 1960-69	Stayed	.546	.749	.563	.909	.521	.867	.855	.918
Ages 21-27	Higher	.372	.576	.356	.553	.262	.689	.492	.667
÷ 11-20	Lower	.468	.677	.469	.679	.469	.748	.893	.977
1955 COHORT									
Moved 1960-69	Stayed	2.807	1.368	2.879	1.403	4.004	1.195	12.576	1.839
Ages 15-22	Higher	2.144	1.196	2.208	1.232	3.163	1.089	10.094	1.859
÷ 6-14	Lower	3.219	1.224	2.050	1.249	2.191	.816	9.998	2.051

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[1] Mean scores on any variable for the age period 18-27 (time period 1950-59) are divided by mean scores for the age period 6-17 (time period 1960-69) to determine if the latter period scores are relatively higher for persons who moved to lower SES natural areas, as would be expected. Only those ratios which indicate higher relative increases for persons who moved to lower rather than upper SES natural areas are underlined solid. However, for those who moved down, the mean score during the following age period was usually higher than that for the mean of those who stayed or moved to a higher SES tract. These cases are underlined dashed. Thus, those who moved down usually had a mean score that was higher than others during the next period even if the increase was not disproportionately greater.

[2] There were either no referrals or sanctions or so few that a ratio could not be computed for the age period 6-10. However, in each of these cases the mean referrals or sanctions for the age period 11-20 were much higher for those who moved to lower SES areas than for those who stayed or moved to higher SES areas.

than that for those who stayed because that large proportion of each cohort residing in the inner city and interstitial areas could move without moving down and their high mean scores would overshadow those from other areas.

The 1960 through 1969 moves to lower SES census tracts for those in the 1942 Cohort were followed by disproportional increases in all but one mean score in comparison to those who moved to higher SES tracts. The earlier moves (1950 through 1959) were not followed by disproportional increases in contact and seriousness scores, although frequency of referrals for those referred and severity of sanctions scores for those sanctioned were disproportionately higher than for those who moved to higher SES tracts. Movement down in the 1949 Cohort resulted in disproportionately higher mean scores in all instances where the ratio could be computed. While the mean scores during the ages afterwards were higher for those from the 1955 Cohort who moved down, they were not proportionately higher than the scores of those who had moved up.

Those from the 1942 Cohort who moved to a higher SES tract between 1950 and 1959 or 1960 and 1969 had, in almost every instance, lower mean scores during the next period than those who moved down or stayed. Those who moved up during the period 1960 to 1969 also had proportionately greater reductions in their mean scores than did those who moved down or stayed. Similarly, those in the 1949 Cohort who moved up in either period, particularly between 1960 and 1969, had proportionately greater reductions in their mean scores than did those who moved down or stayed. In the case of the 1955 Cohort, those who moved up had lower mean scores during the next age period than did those who moved down but their increase was proportionately more than that shown for those who had moved down. All in all, the results were in the direction expected but the hypothesis was consistently supported only by the 1949 Cohort's behavior.

When police grid areas (Table 4) were the spatial unit for the 1942 Cohort the results were different in that both early and later moves down resulted in disproportional increases in the means, although not for referrals and sanctions for the later moves. For all measures except one, both early and later moves were associated with disproportionately higher scores for those who moved down in the 1949 Cohort. Those in the 1955 Cohort who moved down showed disproportionate increases in severity of sanctions scores alone, a point which is consistent with one of our major concerns, i.e., the possibility that increasing severity of sanctions in lower SES areas is contributing to the hardening of these areas.

Moves to higher SES police grid areas resulted in proportionately greater reductions in almost all mean scores for persons from the 1942 and 1949 Cohorts. Although those from the 1955 Cohort who moved up still had lower mean scores than did those who moved down, there were proportionately greater increases in their means than for those who moved down for all measures except referrals and severity of sanctions. This analysis does not tell us which police grid areas experienced this phenomenon but the influx of persons from lower SES areas undoubtedly contributed to rising rates in some of the peripheral areas.

Early and late moves down across natural areas (Table 5) were followed by disproportional increases in mean scores for the 1942 and 1949 Cohorts and higher means with some disproportional increases for those in the 1955 Cohort who moved down rather than staying or moving upward. And, of course, moves to higher SES natural areas produced proportionately greater decreases in most mean scores for those making the move than for those who stayed or moved to lower SES areas for persons from the 1942 and 1949 Cohorts. Again, for the 1955 Cohort, those who moved to higher SES areas had lower means on all measures during both time periods than did those who moved to lower SES areas but their increase in mean scores was not proportionally less on the cohort means for seriousness, referrals, and sanctions than were the increases for persons who moved to lower SES areas. As in the two preceding analyses of census tracts and police grid areas, those areas with disproportional age group increases in mean referrals and severity of sanctions scores are not delineated but are probably those peripheral higher SES areas which have more recently been developing higher delinquency rates and official reactions to them.

No matter which spatial system is utilized, career changes for the 1949 Cohort were in the direction that one would expect based on milieu influences. The divergence from "expected" for the 1955 Cohort makes sense if we remember that some outlying areas had had increasing rates of delinquency and possible official over-reactions to them.

It should be added that had we wished to stack the deck, rather than using lower or higher SES areas as a definition of moving down or up, we could have used moves to higher or lower delinquency areas. This would, however, be a test of a different hypothesis from that which we have been pursuing. Whichever way it was done, the results are influenced not only by what is presumed to be the independent variable, type of area, but by the acquired proclivities of those who move and by the orientation of police officers and authorities which varies to some degree, although difficult to assess, with the area with which they are dealing and the area from which those whom they contact are presumed to belong.

THE IMPACT OF SERIOUSNESS OF CAREERS AND SEVERITY OF SANCTIONS ON LATER SERIOUSNESS

Multiple regression analysis is the next technique utilized to determine if severity of sanctions for the 15 through 17 age group had an effect on seriousness of reasons for police contact during the ages 18 through 20 beyond the effects of seriousness ages 15 through 17. As a background to the multiple regression, the first-order correlations between seriousness during both age groupings and severity of sanctions scores during both age groupings, and several other sets of correlations, are presented in the lower section of Table 6. These correlations are based on the average seriousness of offenses and severity of sanctions scores for cohort residents of each area in the three larger spatial systems for these age groups, a shift from the individual level analyses of the last section of this chapter. It should be noted that these may not be the same people in both age groups for the 1949 Cohort since these ages straddle time periods. This has, of course, been a problem in several other analyses and has generated different results for the 1942 Cohort than for the 1949 and 1955 Cohorts, i.e., there has been less continuity in relationships from age group to age group. With this warning behind us, what do these correlations suggest?

While there are some differences in the results depending on spatial system, trends are the same. None of the 1942 correlations are statistically significant but, since it could be argued that a cohort is not a sample, this may or may not be an important consideration. Whichever, all of the 1942 Cohort correlations are low, indicating that those members of the cohort who resided in a given area may have had a high average seriousness during the ages 15 through 17 but those who resided there did not have a high average seriousness for the ages 18 through 20 and the opposite. In other words, there was relatively little age group continuity in the seriousness of careers for the two age groupings where frequency and seriousness of reasons for police contacts were at their peak. Police contact rates and seriousness were also lower for the 1942 Cohort

TABLE 6. REGRESSION OF SANCTIONS AGE 15-17 AND SERIOUSNESS AGE 15-17 ON SERIOUSNESS 18-20 BY CENSUS TRACTS, POLICE GRID AREAS, AND NATURAL AREAS

	1942 COHORT			1949 COHORT			1955 COHORT		
Dependent Variable:	Tracts	Grids	Nat. Areas	Tracts	Grids	Nat. Areas	Tracts	Grids	Nat. Areas
Seriousness 18-20									
R	.0458	.3814	.1869	.5983	.8335	.6679	.9031	.6864	.6482
Adjusted R^2	.0000	.0033	.0000	.2995	.6778	.4154	.7989	.4417	.3960
Beta 15-17 Sanctions	-.0458	.3814	-.1869	.5983*	.8335*	.6679*	.9031*	.6864*	.6482*
Multiple R	.0463	.3817	.2297	.8788	.9218	.9108	.9305	.7193	.7353
Adjusted R^2	.0000	.0034	.0000	.7268	.8320	.8096	.8390	.4606	.5007
Beta 15-17 Sanctions	-.0420	.3711	-.3138	.1286	-.0397	-.3663	.2456	.3080	-.1146
Beta 15-17 Seriousness	-.0082	.0186	.1842	.7969*	.9578*	1.2055*	.6946	.4352	.8381*
Correlations									
Seriousness 15-17 X Seriousness 18-20	-.0278	.2247	-.0320	.8727	.9217	.8912	.9271	.7037	.7338
Sanctions 15-17 X Sanctions 18-20	.3672	.4642	-.1835	.6101	.8324	.7852	.9296	.6650	.5910
Seriousness 15-17 X Sanctions 15-17	.4672	.5554	.6889	.5894	.9117	.8580	.9466	.8694	.9102
Seriousness 18-20 X Sanctions 18-20	.2444	.5196	.7371	.8890	.9538	.9198	.9508	.9305	.8962
Seriousness 15-17 X Sanctions 18-20	.2633	.0651	-.1900	.8705	.8886	.9394	.9115	.7572	.6644

* F-value indicates significance at .05 level or less.

and examination of the actual rates revealed that the inner city areas were not as highly differentiated from others as for those who lived there from the 1949 and 1955 Cohorts.

Similarly, severity of sanctions scores did not correlate significantly from age group to age group for the 1942 Cohort. In other words, there was not much relationship between the severity of sanctions scores for cohort members from age group to age group on a basis of where they resided and, although there seemed to be more relationship between age groupss for sanctions utilizing police grid areas and census tracts, there was less for natural areas. But again, sanctions were not being administered very severely to juveniles at this time.[3] For the 1949 Cohort, and this was for the years 1964 through 1969, the picture was very different. All of the correlations were higher and statistically significant and the degree of change was considerable. Areas with high average seriousness scores and high average sanctions scores were much more likely to have them for both age groupings and the two larger inner city areas and some of the interstitial areas were becoming more highly differentiated from other areas in the city. The 1955 correlations were somewhat lower for police grid areas and natural areas, not because the inner city had changed but because severity of sanctions had increased in some of the outlying areas for the ages 18 through 20, a sign of increased severity of sanctions no matter where they lived. The boundaries of census tracts were such that this was not captured and only the increased hardening of the inner city was shown.

The next set of correlations shows the relationship of seriousness of reasons for contact to severity of sanctions scores. We have dealt with these relationships in a more general way in earlier research but have not approached them in this ecological framework. The areas in which members of the cohort received more severe sanctions are those in which persons with high seriousness resided. In each case the 1942 Cohort correlations show less relationship between seriousness of careers and severity of sanctions scores than do the 1949 and 1955 Cohorts. Our present concern is over what happens in a given area and its relationship to the organization of society as it generates changes in areas and spatial patterns of phenomena. The emphasis has focused, as the reader will note, on the cyclical nature of phenomena.

The next set of correlations crosses variables by age groups, i.e., we see the correlation of seriousness of careers (15 through 17) with severity of sanctions scores (18 through 20). Since seriousness of careers was highly and significantly correlated for the 1949 and 1955 Cohorts and since severity of sanctions scores were also, but not as highly, correlated, we would expect seriousness of careers to be correlated with severity of sanctions scores during the following ages. Thus 15 through 17 careers correlate with 18 through 20 sanctions. This may be partly because there is an element of lag involved, serious delinquency during earlier ages dealt with at a later age, although this problem should be minor here with age 18 the start of the adult period.

While none of these correlations could be cited as evidence one way or the other, if tests of significance are considered applicable the 1942 Cohort correlations suggest that seriousness in an area was not generally followed by severe sanctions in the next period or the opposite.[4] All of the correlations for the 1949 Cohort were sufficiently high, as were most of those for the 1955 Cohort, to indicate that areas with high seriousness during one period had severe sanctions for their cohort members during the next period. Seriousness was followed by seriousness and seriousness resulted in sanctions.

Turning now to the first step of the regression analysis in the top half of Table 6, we find that severity of sanctions during the ages 15 through 17 in police grids is followed by increasing seriousness for the ages 18 through 20 in for the 1942 Cohort (but not in tracts and natural areas). Not only are the correlations low and not significant but the largest correlation produced is for police grid areas and is in the opposite direction from what would be expected if severe sanctions were a deterrent to future seriousness in the area.

The 1949 and 1955 correlations concern us the most. Both tend to reaffirm what has been said about misconceptions of the effectiveness of severe sanctions. What we find is that severity of sanctions during the ages 15 through 17 and seriousness of careers at ages 18 through 20 are so highly correlated that one is inclined to conclude that severe sanctions contribute to the hardening of the inner city and interstitial areas as centers of delinquency and crime at the same time that diffusion to other areas has been occurring.[5] There is the problem of controlling for seriousness of careers 15 through 17 in further assessment of these findings but even then it appears that severe sanctions no more lead to less serious behavior than mild sanctions lead to more serious misbehavior, as may be seen in the next step down in Table 6.

When seriousness of careers age 15 through 17 was entered in the multiple regression analysis, the result was an increase in the size of the correlations so that they were higher than previously. The net effect of severity of sanctions on the relationship between seriousness of career 15 through 17 and 18 through 20 was positive in some cases and negative in others, varying with the spatial system utilized but in no case statistically significant. We again concluded that seriousness of sanctions was not having the effects desired, that is, sanctions did not significantly reduce seriousness during the following ages. Severe sanctions are, in fact, followed by serious delinquency and youthful crime.

The more one analyzes the data the more sure one becomes that not only are the characteristics of the inner city and interstitial areas becoming more solidified but, to the extent that population movement outward has taken place, there have been some increases in delinquency rates in areas that did not previously have them and in areas which have not shown the elements of ecological transition.[6]

COMPARISON OF POLICE CONTACT RATES FOR THE ENTIRE CITY AND THE THREE COHORTS

Although the reader may have concluded that the spatial distribution of delinquency and crime in Racine follows essentially the same pattern whether the various official series of rates or official contact data for the three cohorts are presented, we have nowhere presented data which show this to to be or not to be the case. Precise comparison of the various series with the cohort data is really not possible but some comparisons may be made for the 1970s. Considerable congruence would be expected, of course, because the three cohorts are presumed to be as representative as any other three cohorts that might have been selected which included persons between the ages of 15 and 34 during the 1970s (see Diagram 2, Chapter 6).

The Pearsonian correlations between average rates for the 1970s for appropriate data sets for all residents of Racine and average rates for the three cohorts are shown in Table 7. We have previously mentioned that whether in-area cohort rates were computed based on the Racine population or the in-area cohort population, the rates would be highly correlated and they were, as indicated in the footnotes to this table. However, and this is the important point, there was an almost perfect correlation between either set of cohort tract rates for the 1970s and the Racine Part I Offense tract rates for 1970 through 1978. Both cohort police contact rates for police grid areas were highly correlated and both were highly correlated with Part I Offenses in police grid areas. It should be added that we have previously

TABLE 7. INTERCORRELATIONS OF OFFICIAL RATES FOR CITY OF RACINE IN 1970's AND COHORT RATES FOR 1970's

	Census Tracts[1]		Police Grid Areas
	Part I in Tracts 1970-1978	Arrest Rates by Tract of Residence 1970-1978	Part I Offenses in Grids 1970-1979
Cohort Police Contacts 1970's[2]:			
Per 100 Population in Area[3]	.9987		.9784
Per 100 Cohort Residents in Area	.9981		.8753
Cohort Contacts 1970's[4]:			
Per 100 Cohort Residents in Area		.8154	
Cohort Referrals 1970's:			
Per 100 Cohort Residents in Area		.8209	
Cohort Seriousness Scores 1970's:			
Per 100 Cohort Residents in Area		.8834	

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[1] The average official rates were obtained by dividing the number of offenses or arrests in an area for the years included by the total population of the area for the years included. In area contact rates may be found in Table 1, Chapter 6, and referral rates in Table 3, Chapter 6.

[2] The average cohort rate was obtained by dividing the number of contacts, seriousness scores, or number of referrals in the area by the 1975 population of the area or by the cohort population of the area for the 1970's.

[3] The two sets of census tract rates correlated .9998; the two sets of grid rates correlated .9241.

[4] Contacts and referrals correlated .9774; contacts and seriousness correlated .9724; referrals and seriousness correlated .9583.

found that total contact rates and contact rates with traffic offenses omitted were very highly correlated for the cohorts, as were most any other measures based on the inclusion or deletion of various categories of contacts.

The Racine arrest rates series by census tract of residence is also included in this analysis and is correlated with the cohort contact rates by place of residence, mean seriousness scores, and referral rates. These three rates were highly correlated for cohort members by place of residence and each of these rates was in turn correlated with arrest rates by tract of residence. It is interesting that the correlations increased from .815 for contacts to .883 for seriousness, the measure which might be expected to correlate most highly with arrest rates because more serious reasons for police contact are more likely to culminate in arrests.

Had we selected each year, commencing in 1970, for each official series and for each set of cohort rates, the year-by-year correlations would not have been as high because aggregation of the data to produce a single rate for each area for the 10-year period tends to increase the correlations but we believe that this simple exercise indicates that the cohort data are quite representative of what has been happening in terms of delinquency and crime in these areas.

TRAFFIC AND TRANSPORTATION AND CHANGING PATTERNS OF DELINQUENCY AND CRIME

In Chapter 1 it was pointed out that automobile registrations and traffic had increased over the 30-year period at the same time that mass transit ridership decreased. While it is easy to draw parallels between measures of automobile usage and police contact rates, and traffic offenses do constitute a large proportion of all offenses, the volume of moving vehicles does not account directly for more than that part of the increase in contacts which derive from driving. On the other hand, we have shown in our earlier research that many offenses are multiple and involve illegal or careless use of the automobile as well as liquor, sex, and other related violations.

As far as changes in offense rates in areas are concerned, perusal of a map with major arterials reveals that the "natural barriers" (large city parks and extensive industrial land use divide the city in half from north to south commencing on the west side of Census Tract 14 and extending down to Census Tract 8) are broached by half a dozen major thoroughfares, all of which lead to the inner city and pass through interstitial areas on the way. Some of the differences in patterns of offenses by place of residence vs. place of contact are explained when maps are drawn showing where cohort members resided vs. where they have had police contacts. These have clearly shown that many police contacts take place along these major arterials as people drive from place of residence to areas of work and play and return. For those who reside in more peripheral areas, contacts with the police may occur during the trip and in the inner city or transitional area which is their goal. For those who reside in the inner city and transitional areas, or in different peripheral areas, contacts are made with the police in transit and at their peripheral place of play. Comparison of traffic flow maps for 1956 and 1978, for example, reveals that between these years the number of vehicles arriving at several peripheral intersections has doubled and trebled.

Several bus routes (with high ridership of persons 16-24 years of age) facilitate the movement of those who do not have automobiles or access to them from the inner city and transitional areas to peripheral recreational attractions. More specifically, even without an automobile, peripheral areas to the northwest and southwest (with developing in-area offense rates) are readily reached by bus lines. Thus, the rhythmical, temporal movement of the population by auto or bus must be considered if one is to fully explain variance in delinquency and crime rates and their changing spatial patterns. Again, beware of simplistic explanations of changing patterns which attempt to account for most of the variance with too few variables, often the variables that may be readily quantified and placed in a simple analytic scheme.

SUMMARY

In this chapter we have noted that consistent increases with age through the late teens and into the early twenties in the percent of each cohort's members with police contacts is more characteristic of some inner city and interstitial areas than of others. Furthermore, it was also apparent that some inner city neighborhoods were delineated in such a fashion as to capture the extremes of the cohort with as high as 70% of the youth having police contacts by the late teens and continuing involvement past the mid-twenties.

A series of regression analyses provides confirmation for the notion of a hardening inner city. When the consequences of movement were examined it became even more apparent that change in residence to crime-producing neighborhoods generated proportionately more increases in contacts, seriousness scores, referrals, and ensuing sanctions than were generated for those who moved to areas which were considered less likely to produce crime. While this was particularly true for persons from the 1949 Cohort, it appeared that discrepancies for the 1955 Cohort could be accounted for by the fact that some peripheral areas that had not been classified as crime-producing had, during the 1970s, experienced increases in indicators of involvement in the justice system and changes in land use which would make them no longer milieus unlikely to increase the delinquent and criminal behavior of those who moved to the area.

Regression analyses of the seriousness of offenses and the severity of sanctions provided even further evidence that sanctions against members of a cohort who reside in an area are not followed by reductions in seriousness of offenses by cohort residents of the area during the following period. Moreover, it even appeared that severe sanctions were followed by increasing seriousness.

Other analyses included in this chapter revealed that the spatial distribution of offense rates for the entire population of Racine for the 1970s were highly correlated with cohort rates for the same period. It has also been shown that the expansion of the city and ensuing patterns of population movement played a part in the changing distribution of delinquency and crime.

We shall now turn to the last substantive chapter, one in which multivariate techniques are utilized in further examination of the hypothesis that patterns of delinquency and crime follow changes in the ecological structure of the city.

FOOTNOTES

[1] See Chapters 7, 8, and 9, op. cit., Assessing the Relationship of Adult Criminal Careers to Juvenile Careers.

[2] These competing approaches have been over-simplified; one hypothesis has birds of a feather flocking together (Gluecks) while the other position is that flocking makes for similarity in feathers (Sutherland). For an even-handed treatment of both positions but one which leans toward the neighborhood as providing the milieu in which delinquency is a normal outgrowth of that way of life, see John Mack, "Full-Time Miscreants, Delinquent Neighborhoods and Criminal Networks," British Journal of Sociology, Vol. 15, 1963, pp. 38-53.

[3] The juvenile court judge receives criticism from several sides. One group is concerned because the court deals too harshly with youth and the other believes the opposite. There are still others who are concerned because the "punishment" does not fit the "crime" and others who are aggrieved because the circumstances which generate behavior are not given sufficient consideration. Among the numerous publications which have been highly critical of the operation of the court are the following: Patrick T. Murphy, Our Kindly Parent...The State: The Juvenile Justice System and How It Works, New York: Viking Press, 1974; Anthony Platt, The Child Savers, Chicago: The University of Chicago Press, 1969; Nathan F. Leopold, Jr., Life Plus 99 Years, Garden City, New York: Doubleday & Co., 1958. For a very recent critical text see: Barry Krisberg and James Austin, The Children

of Ishmael: Critical Perspectives on Juvenile Justice, Palo Alto, California: Mayfield, 1978. LaMar T. Empey has also summed it up quite well in "Juvenile Court: The Tarnished Superparent," Chapter 16, American Delinquency: Its Meaning and Construction, Homewood, Illinois: The Dorsey Press, 1978, pp. 440-483. It may well be, as suggested by Martinson after consideration of over 200 studies, that nothing works. See Robert Martinson's "What Works? 'The Martinson Report'," from "What Works? Questions and Answers about Prison Reform," The Public Interest, Vol. 35, 1974, pp. 22-55, reprinted in Norman Johnson and Leonard D. Savitz (eds.), Justice and Corrections, New York: John Wiley & Sons, 1978, pp. 788-810. Lest the reader conclude that nothing has been learned, Palmer's reply should be noted, Ted Palmer, "Martinson Revisited," Journal of Research in Crime and Delinquency, Vol. 12, 1975, pp. 133-152, also reprinted, op cit., pp. 811-827. Whether juveniles who have committed noncriminal acts should be dealt with by a correctional system has become an issue in more recent years as well-stated by William H. Sheridan, "Juveniles Who Commit Non-Criminal Acts: Why Treat in a Correctional System?" Federal Probation, Vol. 31, 1967, pp. 26-30. A review of the even more recent literature on corrections in the United States to 1975 has been conducted by David F. Greenberg. He cites studies in which random assignment to experimental and control groups were made but the results were no more heartening in terms of evidence of correctional program effectiveness than from previous surveys. In concluding a chapter, "The Correctional Effects of Corrections," he refers again to the Lipton, Martinson, and Wilks survey by saying that, "The blanket assertion that 'nothing works' is an exaggeration, but not by very much." David F. Greenberg (ed.), Corrections and Punishment, Beverly Hills: Sage Publications, 1978, Chapter 5, p. 141.

[4] Although our own thrust has been toward investigation of the failure of the system to deter specific people from continued misbehavior or to rehabilitate those who are dealt with in one manner or another, including probation and institutionalization, others have been concerned with general deterrence. The difficulty of disentangling the effects of arrest on crime and crime on arrests in order to assess the deterrence effect has long been considered a thorny problem. Greenberg, et al., contend that studies of crime rates which have appeared over the last decade and which have been interpreted as supportive of the deterrence position are really not. See David F. Greenberg, Ronald C. Kessler, and Charles H. Logan, "A Panel Model of Crime Rates and Arrest Rates," American Sociological Review, Vol. 44, 1979, pp. 843-850.

[5] Very few studies have been designed in such a fashion to give a definitive answer to the question of what are the consequences of incarceration (institutionalization for juveniles), although those who have attempted to introduce appropriate controls conclude that incarceration does not work. For one of the more definitive studies, see Andrew Hopkins,

"Imprisonment and Recidivism: A Quasi-Experimental Study," Journal of Research in Crime and Delinquency, Vol. 13, 1976, pp. 13-32. Hopkins concludes that incarceration may actually be worse than noninstitutional treatment.

[6] Movement of families with children from the inner city to interstitial areas and to suburban areas was sure to have an impact on patterns of crime. Rates in the inner city would be reduced (although they would still remain the highest) and rates in those more peripheral areas in which the housing supply fitted the purses of those not too affluent would increase. To the extent that Black youth make up a disproportionate number of the population (as well as a disproportionate number of the poor), Black offense rates for violent and property crimes will be higher than those for Whites and the continued concentration of Blacks in the inner city contributes to its hardening. Skogman has dealt with the age and race composition of the population and their effects on crime rates in Wesley G. Skogman, Chapter 14, "Crime in Contemporary America," in Hugh Davis Graham and Ted Robert Gurr (eds.), Violence in America: Historical and Comparative Perspectives, Beverly Hills: Sage Publications, 1979.

The impact of youthful offenders on offense rates has also been shown in Peter W. Greenwood, Joan Petersilia, and Franklin E. Zimring, Age, Crime, and Sanctions: The Transition from Juvenile to Adult Court, Santa Monica: Rand, 1980.

Chapter 9. Neighborhood Characteristics and Crime Rates, 1950-1970

INTRODUCTION

This chapter's multivariate analysis of the interrelationships among neighborhood ecological variables and delinquency and crime rates during the 1950s, 1960s, and 1970s leads to precise statements about the relationship between ecological variables and delinquency and crime over a 30-year period.[1] The combined effects of ecological variables and delinquency and crime rates are also utilized to account for differences in delinquency and crime rates in succeeding time periods, a more complex analytic technique than heretofore presented (although time lags were inserted in some of the earlier zero-order regression analyses).

Five indicators of neighborhood characteristics are employed in this analysis: the housing quality factor score, percent Black, the land use canonical score, target density, and residential vacancies. Each variable was regarded as one which would be productive of or associated with delinquency and crime in an area. They are also indicators of the three major dimensions of ecological differentiation which have been consistently identified in research on urban areas in the United States: social rank, racial segregation, and family status.[2] An indicator of transiency, a concept which has received some empirical support in previous ecological research, has also been included.[3]

Indicators of delinquency and crime are the cohort police contact rates for the total number of contacts, contacts for offenses against persons, contacts for offenses against property, public disorder offenses, juvenile status offenses, and moving vehicle violations. The statistical method employed is path analysis, an adaptation of multiple regression analysis to those cases where the independent variables are proposed to have causal effects on the dependent variables.

THE ECOLOGY OF THE NEIGHBORHOOD AND CRIME

Zero-Order Relationships

In order to provide a better grasp of the data used in the path analysis we have included Table 1 in which the zero-order correlations for the neighborhood ecological characteristics are presented. That some of these correlations systematically change from 1950 to 1970 forewarns us that the effects of neighborhood characteristics on delinquency and crime are likely to vary between 1950 and 1970. For example, percent residential vacancy had a positive relationship to housing scores in 1950 but a negative one in 1960 and even more negative in 1970, the proportion of vacancies having greatly increased in the poorest housing areas. Likewise, percent of the occupied dwelling units occupied by Blacks had a negative correlation with residential vacancy in 1950 but by 1970 those neighborhoods with higher proportions of Blacks also had high residential vacancies. The number of targets had a low negative correlation with residential vacancy in 1950 but this had increased to a positive correlation

TABLE 1. INTERCORRELATION OF SELECTED NEIGHBORHOOD ECOLOGICAL CHARACTERISTICS

	Housing Score	Percent Black	Land Use	Targets	Percent Resid. Vacancy
1950's:					
Housing Score	1.000				
Percent Black	-.488	1.000			
Land Use	.377	-.336	1.000		
Targets	-.512	.353	.083	1.000	
Percent Residential Vacancy	.192	-.092	-.251	-.167	1.000
1960's:					
Housing Score	1.000				
Percent Black	-.584	1.000			
Land Use	.400	-.445	1.000		
Targets	-.679	.307	-.195	1.000	
Percent Residential Vacancy	-.409	.444	-.579	.423	1.000
1970's:					
Housing Score	1.000				
Percent Black	-.531	1.000			
Land Use	.345	-.297	1.000		
Targets	-.401	.377	-.107	1.000	
Percent Residential Vacancy	-.676	.710	-.230	.480	1.000

by 1970. All of this indicates that as the city grew the inner city and interstitial areas became more and more differentiated from better residential areas.

A three-dimensional map of neighborhood variation in police contact rates is included at this point for each of the decades based on the census population at the start of the decade (Maps 1-3). As pointed out when similar maps were presented in earlier chapters, the relatively low population of several peripheral neighborhoods during the 1950s and the attractiveness of various facilities in these peripheral areas produced relatively high police contact rates, rates which were of diminishing visibility during successive decades as inner city and interstitial in-area contact rates increased.

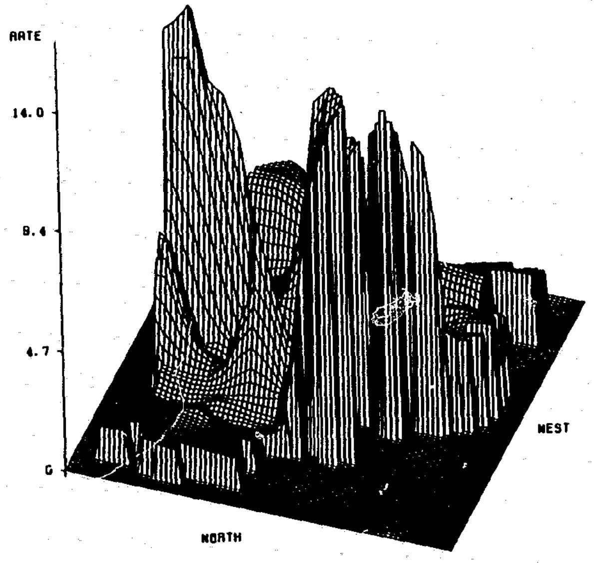
We must remember that the age structure of the cohort members during the 1950s was decidedly lower than in the 1960s and 1970s, a factor which must be considered if rates rather than the shape of the spatial distribution of police contacts is also taken into consideration. But the main point is to simply make a visual presentation of the spatial pattern of the total contact rates utilized in the multivariate analysis described in this chapter.

The intercorrelations of various offense rates and numbers of offenses by neighborhoods are presented in Table 2. Here again differences are found from time period to time period for some offenses, notably between the 1950s and 1960s for offenses against the person and status offenses. Otherwise, there appears

MAP 1

CONTACTS PER 100 PERSONS BY NEIGHBORHOOD–1950'S

BY NEIGHBORHOOD OF CONTACT

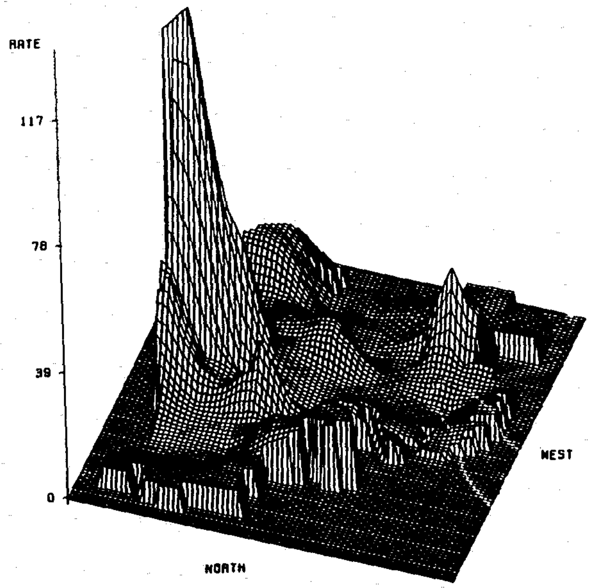


RATE BASED ON 1950 POPULATION

MAP 2

CONTACTS PER 100 PERSONS BY NEIGHBORHOOD–1960'S

BY NEIGHBORHOOD OF CONTACT

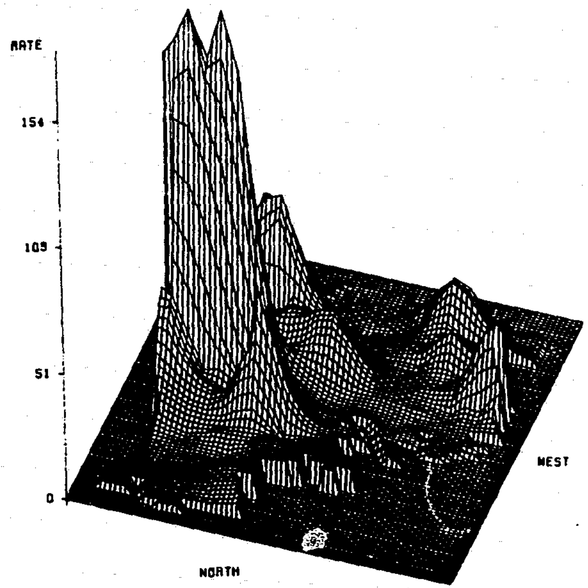


RATE BASED ON 1960 POPULATION

MAP 3

CONTACTS PER 100 PERSONS BY NEIGHBORHOOD–1970'S

BY NEIGHBORHOOD OF CONTACT



RATE BASED ON 1970 POPULATION

TABLE 2. INTERCORRELATION OF SELECTED OFFENSES BY NEIGHBORHOODS: OFFENSES PER 100 POPULATION AND NUMBER OF OFFENSES

	Total Contacts	Non-Traffic	Person	Property	Public Disorder	Status Offenses	Traffic
1950's:							
Total Contacts	1.000	.978	-.096	.816	.776	.718	.778
Non-Traffic	*.979*	1.000	-.083	.758	.796	.786	.629
Persons	*.053*	*.103*	1.000	-.037	-.077	-.070	-.105
Property	*.810*	*.807*	*.185*	1.000	.633	.406	.755
Public Disorder	*.849*	*.884*	*.070*	*.512*	1.000	.320	.491
Status Offenses	*.652*	*.713*	*-.044*	*.477*	*.540*	1.000	.308
Traffic	*.858*	*.735*	*-.080*	*.655*	*.599*	*.373*	1.000
1960's:							
Total Contacts	1.000	.989	.782	.935	.971	.786	.967
Non-Traffic	*.979*	1.000	.772	.941	.986	.837	.918
Person	*.711*	*.742*	1.000	.662	.698	.643	.756
Property	*.883*	*.887*	*.556*	1.000	.921	.694	.877
Public Disorder	*.972*	*.975*	*.721*	*.825*	1.000	.806	.894
Status Offenses	*.705*	*.794*	*.523*	*.602*	*.729*	1.000	.658
Traffic	*.886*	*.775*	*.525*	*.773*	*.811*	*.387*	1.000
1970's:							
Total Contacts	1.000	.985	.930	.808	.979	.775	.961
Non-Traffic	*.991*	1.000	.915	.830	.980	.793	.899
Person	*.823*	*.830*	1.000	.700	.926	.731	.893
Property	*.712*	*.731*	*.458*	1.000	.736	.619	.722
Public Disorder	*.963*	*.971*	*.808*	*.591*	1.000	.815	.914
Status Offenses	*.752*	*.775*	*.680*	*.426*	*.768*	1.000	.700
Traffic	*.926*	*.867*	*.720*	*.594*	*.842*	*.621*	1.000

(Offense rates in regular type and number of offenses in *italics*) to be considerable stability between time periods for most offense category spatial patterns. It should be noted that a similar pattern of correlations is usually obtained whether rates or sheer numbers of offenses are considered. Since we have been concerned about differences in results based on differences in methods by which rates are computed, we shall devote considerable attention to this problem as the analyses progress.* What we shall find is that the combination of change in patterns of neighborhood characteristics, change in the interrelationships of offenses, and considerable city growth which adds new residential areas for each time period will result in time period variation in the correlations of neighborhood characteristics and various types of juvenile and adult offenses.

That housing quality scores have their most consistent relationship with all offense category rates during the 1960 time period is shown in Table 3. Percent Black changed from low correlations with most offense categories in the 1950s to modest positive correlations in the 1960s. By contrast, non-residential land use was inconsistently correlated with offense types in the 1950s but with all offense types in the 1960s and in the 1970s. The pattern for targets was even different--there was relatively little correlation during the 1950s but most offense rates were substantially correlated with targets in the 1960s followed by a decline during the 1970s. What might be considered the most unexpected correlations were those for residential vacancies which were very low and negative in the 1950s, modest or

TABLE 3. CORRELATIONS OF OFFENSES AND NEIGHBORHOOD CHARACTERISTICS: OFFENSES PER 100 POPULATION AND NUMBER OF OFFENSES

	Rates					Number of Offenses				
	Housing Score	Percent Black	Land Use	Targets	Percent Residential Vacant	Housing Score	Percent Black	Land Use	Targets	Percent Residential Vacant
1950's										
Total Contacts	-.503	.108	-.513	.114	-.108	-.448	.202	-.047	.651	-.165
Non-Traffic	-.510	.084	-.520	.049	-.098	-.460	.200	-.040	.638	-.166
Person	.029	-.107	.088	.080	-.027	.019	-.105	.082	.096	-.028
Property	-.471	.079	-.475	.209	-.059	-.398	.099	.053	.681	-.111
Public Disorder	-.369	.094	-.637	.032	-.094	-.303	.159	-.110	.368	-.146
Status Offenses	-.402	-.005	-.208	-.127	-.050	-.494	.229	-.052	.388	-.122
Traffic	-.334	.150	-.344	.274	-.107	-.325	.173	-.057	.558	-.127
1960's										
Total Contacts	-.472	.256	-.480	.573	.555	-.752	.335	-.074	.833	.462
Non-Traffic	-.483	.238	-.518	.544	.526	-.749	.337	-.032	.788	.413
Person	-.434	.351	-.552	.387	.625	-.552	.319	-.037	.436	.330
Property	-.422	.225	-.485	.529	.568	-.624	.270	-.101	.730	.477
Public Disorder	-.451	.174	-.456	.532	.409	-.732	.319	-.010	.788	.344
Status Offenses	-.524	.290	-.646	.419	.461	-.606	.284	.027	.576	.218
Traffic	-.428	.271	-.388	.591	.573	-.634	.280	-.155	.798	.498
1970's										
Total Contacts	-.400	.230	-.576	.219	.159	-.693	.458	-.134	.422	.544
Non-Traffic	-.418	.214	-.513	.274	.186	-.675	.462	-.097	.433	.550
Person	-.409	.298	-.414	.156	.152	-.591	.484	-.045	.258	.478
Property	-.224	.129	-.446	.309	.004	-.365	.233	-.133	.507	.234
Public Disorder	-.437	.254	-.495	.251	.213	-.680	.525	-.111	.384	.614
Status Offenses	-.514	.256	-.491	.267	.212	-.559	.375	.024	.197	.398
Traffic	-.344	.242	-.649	.116	.104	-.671	.397	-.228	.349	.465

relatively high and positive in the 1960s for all offense categories, but low again, although still positive, in the 1970s. The reader need only refer back to residential vacancy Maps 14-16 in Chapter 2 and contact rate decade Maps 7-9 in Chapter 6 in order to see how the spatial variation represented from decade to decade by these maps could produce the correlations shown in this table.

Number of offenses presented a somewhat different pattern of correlations with housing scores (modest in the 1950s, relatively higher in the 1960s and 1970s than for rates) indicating that neighborhoods with low housing quality scores had high numbers of offenses. Progression was found between percent Black and number of offenses from the 1950s to the 1970s. There was little relationship between residential use of blocks in neighborhoods and number of offenses but most correlations were negative, as in the case of rates. Unlike the correlations based on rates, targets had modest or high correlations with number of offenses during the 1950s, were quite high during the 1960s, with some decline during the 1970s. Although percent residential vacancies had relatively low negative correlations with number of offenses in the 1950s, there were modest positive correlations in the 1960s, increasing in most cases during the 1970s.

At this stage no attempt is made to speak with any finality about the relationship of neighborhood characteristics to offense rates or numbers of offenses because they are intertwined in various combinations so that various effects are best described by the path analysis which follows.

The Path Analyses

Although we have made reference to stability over three time periods in the characteristics of some neighborhoods and changes in others in terms of land use, housing quality, and other indicators and in terms of offense rates and numbers of offenses, no evidence of the extent of rate or offense number stability has been presented. Table 4 reveals that, even with population movement toward the periphery of the city, neighborhood stability in offense rates has been maintained and has even increased between the 1960s and 1970s. Evidence of increasing stability was also apparent when correlations were based on number of offenses, most correlations between 1960 and 1970 offenses being greater than their 1950 and 1960 counterparts. We shall later see how this relates to our position that the inner city is "hardening" at the same time that new areas with high offense rates and sheer numbers of offenses are developing.

The 1950s

The path analysis results for the effects of the 1950 ecological variables on the 1950 offense rates are presented in Table 5. The path coefficient represents the proportional standard deviation unit change in the dependent variable (offense rates or number of offenses) associated with one standard deviation unit change in the independent variable. In general, the absolute value of path coefficients will range between zero and one.

TABLE 4. CORRELATION OF 1950-1960 AND 1960-1970 NEIGHBORHOOD OFFENSE RATES AND NUMBER OF OFFENSES

		Total Contacts	Non-Traffic	Person	Property	Public Disorder	Status Offenses	Traffic
OFFENSE RATES:					1960's			
	Total Contacts	.714	.725	.714	.640	.689	.607	.674
1950's	Non-Traffic	.605	.632	.650	.554	.595	.542	.542
	Person	-.075	-.093	-.075	-.071	-.081	-.103	-.042
	Property	.721	.728	.754	.616	.698	.661	.684
	Public Disorder	.561	.594	.702	.485	.568	.512	.489
	Status Offenses	.198	.218	.254	.205	.163	.215	.158
	Traffic	.835	.794	.700	.712	.778	.627	.875
					1970's			
	Total Contacts	.898	.938	.819	.869	.931	.763	.783
1960's	Non-Traffic	.861	.906	.773	.838	.891	.766	.742
	Person	.864	.864	.775	.856	.819	.627	.820
	Property	.794	.851	.731	.789	.847	.786	.661
	Public Disorder	.799	.857	.712	.768	.843	.715	.662
	Status Offenses	.722	.724	.610	.706	.707	.672	.682
	Traffic	.912	.942	.853	.876	.950	.718	.811
NUMBER OF OFFENSES:					1960's			
	Total Contacts	.822	.759	.635	.627	.798	.422	.824
1950's	Non-Traffic	.782	.745	.642	.610	.766	.456	.729
	Person	-.014	-.050	-.006	.005	-.040	-.029	.065
	Property	.701	.640	.407	.564	.643	.390	.715
	Public Disorder	.598	.577	.626	.455	.592	.312	.545
	Status Offenses	.494	.511	.497	.376	.515	.377	.367
	Traffic	.762	.644	.490	.546	.723	.253	.901
					1970's			
	Total Contacts	.915	.907	.763	.667	.899	.594	.831
1960's	Non-Traffic	.907	.917	.784	.661	.913	.668	.775
	Person	.544	.554	.508	.310	.577	.413	.447
	Property	.876	.887	.682	.859	.843	.580	.747
	Public Disorder	.881	.882	.771	.588	.890	.604	.775
	Status Offenses	.686	.715	.601	.377	.754	.714	.524
	Traffic	.783	.737	.592	.574	.721	.328	.823

TABLE 5. PATH ANALYSIS RESULTS FOR 1950 COHORT CRIME RATES AND NUMBERS

	DEPENDENT VARIABLES						
INDEPENDENT VARIABLES[1]	Total Contacts	Non-Traffic	Person	Property	Public Disorder	Status Offenses	Traffic
				Offense Rates			
Housing Score	-.412*	-.492*	.032	-.320	-.122	-.742*	-.047
Percent Black	-.282*	-.298*	-.139	-.324*	-.277*	-.196	-.147
Land Use	-.498*	-.469*	.013	-.510*	-.760*	.045	-.444*
Targets	.014	-.085	.141	.181	.085	-.439*	.310
Residential Vacancies	-.178	-.163	-.019	-.125	-.272*	.013	-.171
$\bar{R}^2$[2]	.386*	.418*	-.090	.341*	.478*	.265*	.158*
				Number of Offenses			
Housing Score	-.136	-.180	.033	-.145	-.073	-.474*	.010
Percent Black	-.127	-.128	.147	-.222	-.064	-.013	-.094
Land Use	-.108	-.081	.001	-.022	-.163	.115	-.162
Targets	.623*	.586*	.161	.688*	.346*	.144	.597*
Residential Vacancies	-.073	-.066	-.021	.005	-.120	.021	-.079
$\bar{R}^2$[2]	.392*	.377*	-.086	.442*	.074	.190*	.251*

[1] The ecological variables were measured in 1950.

[2] R^2 adjusted for degrees of freedom.

* Statistically significant at the .05 level or beyond,

The housing quality factor score has a significant effect on three delinquency rates during the 1950s, those for total contacts, non-traffic offenses, and juvenile status offenses. The sign of the coefficients (-.412, -.492, and -.742) indicates that the higher the housing quality, the lower the offense rate. There was only one significant effect on number of offenses, that being negative for status offenses. This finding is interesting since individual-level analyses in recent years have rather consistently shown that the less serious offenses such as status offenses are not related to the individual's social class,[5] although serious offenses whether based on official or self-report data are so related.

Four of the path coefficients between percent Black and offense rates were statistically significant, those for total offenses, non-traffic offenses, property offenses and public disorder offenses, the higher the percent Black, the lower the crime rate. Since this finding is not consistent with other research,[6] there are two points which should be made. First, an examination of the zero-order correlations shows that our result is due to the intercorrelations among the independent variables. For example, the zero-order correlation of percent Black with all offense rates is low, whereas it is -.488 with the housing quality factor score. There was virtually no zero-order relationship between neighborhood racial composition and delinquency during the 1950s but when neighborhood socioeconomic status and other variables were held constant, neighborhoods with a high concentration of Blacks tended to have lower delinquency rates. It is possible that this result reflects the process of neighborhood cohesion during the 1950s when Blacks represented a small proportion of the total population in Racine. We must also note that there were no significant path coefficients between percent Black and number of offenses and that with one exception these were also negative but that this was the opposite of the zero-order correlations which were in all instances save one positive. Here again, holding neighborhood socioeconomic status constant presented a different picture of the relationship of percent Black to number of offenses.

The land use canonical score is related to five indicators of delinquency: rates for total contacts, non-traffic contacts, property, public disorder, and traffic offenses. The signs of all these coefficients are negative which means that the higher the level of residential land use in a neighborhood, the lower the delinquency rate. This suggests that residential areas serve as "guardians" against the intrusion of delinquency and crime.[7] It would explain the negative relationship between land use and property offenses which we might expect to be positive if residential dwellings were major targets for offenses such as burglary and if the land use score simply measured the availability of targets. These coefficients were consistent with the zero-order correlations. On the other hand, land use did not produce a single significant path coefficient (most had the same signs as for rates) with number of contacts. In other words, there was less relationship between residential land use and number of offenses than between residential land use and offense rates.

The finding that the mean number of targets in a neighborhood is significantly related to status offense rates may be surprising. However, we must remember that the 1950 rates are based only on juvenile offenses which are more likely to be committed in neighborhoods of residence which include targets. We shall see whether analysis of offense rates with a large adult component sheds a different light on this issue. On the other hand, targets and number of offenses produced five significant positive coefficients consistent with the zero-order correlations, all of which were also positive. Therefore, regardless of the relationships obtained with a rate based on population, targets did generate significantly large numbers of offenses with the exceptions of offenses against the person and status offenses.

Finally, we observe that residential vacancies are, with the exception of public disorder offenses, unrelated to the 1950 offense rates and number of offenses, essentially as they were at the zero-order level. Thus, residential vacancies (an indicator of transiency) net of land use and housing quality may not have much effect on juvenile offense rates--or on number of offenses.

The independent variables together accounted for significant proportions of the variance in total offense rates, non-traffic, property, public disorder, and traffic offenses. Still, only 38%

of the variance for total offenses was accounted for by these ecological variables. With the exceptions of property and traffic offenses, the independent variables accounted for essentially the same or a lesser proportion of the number of offenses of these types.

To summarize, analysis of the 1950 contact rates shows that the most important effects are associated with land use, followed by housing quality and percent Black. The higher the level of residential land use in a neighborhood, the lower the offense rate. The higher the proportion of dwelling units occupied by Blacks and the higher the quality of the housing, the lower the offense rates. Number of offenses was best accounted for by the presence of targets. To put it another way, the data show some effects of land use, neighborhood socioeconomic status, and racial composition in the 1950s, but not all-pervasive effects because juvenile offenses are probably not influenced by areal characteristics as strongly as are adult offenses.

The 1960s

Table 6 presents results of the the analysis of the effects of the 1960 ecological variables on the 1960 offense rates, juvenile and adult, since persons from the three cohorts range in age from 6 through 27. The pattern of relationships in this table is quite different from that found in Table 5. It must be remembered, of course, that seven neighborhoods which now had sufficient population to produce a valid rate were added to the analysis in 1960. The housing quality factor score shows no

TABLE 6. PATH ANALYSIS RESULTS FOR 1960 COHORT CRIME RATES AND NUMBERS

INDEPENDENT VARIABLES[1]	DEPENDENT VARIABLES						
	Total Contacts	Non-Traffic	Person	Property	Public Disorder	Status Offenses	Traffic
				Offense Rates			
Housing Score	-.053	-.117	-.127	-.016	-.112	-.291	.064
Percent Black	-.147	-.196	-.052	-.171	-.221	-.195	-.055
Land Use	-.300*	-.376*	-.217*	-.308*	-.397*	-.566*	-.152
Targets	.419*	.370*	.095	.385*	.425*	.156	.481*
Residential Vacancies	.248	.190	.396*	.296*	.052	.034	.332*
$\bar{R}^2$ [2]	.457*	.455*	.419*	.436*	.382*	.495*	.439*
				Number of Offenses			
Housing Score	-.507*	-.576*	-.581*	.375*	-.538*	-.543*	.266*
Percent Black	-.074	-.057	.016	-.107	-.039	.009	-.096
Land Use	.360*	.408*	.380*	.293*	.372*	.349*	.198
Targets	.452*	.376*	-.023	.410*	.434*	.232	.553*
Residential Vacancies	.305*	.280*	.315*	.367*	.173	.095	.313*
$\bar{R}^2$ [2]	.831*	.791*	.344*	.613*	.756*	.443*	.678*

[1] The ecological variables were measured in 1960.

[2] R^2 adjusted for degrees of freedom.

* Statistically significant at the .05 level or beyond.

statistically significant effects on offense rates but does on number of offenses, as it did in the zero-order correlations, better housing being inversely related to number of offenses. Percent Black has no significant relationships to offense rates but all coefficients are again negative. Since percent Black is correlated with housing quality -.584 at the zero-order level, this finding is again the result of holding constant other variables such as housing quality.

Residential land use now has statistically significant negative effects on all offense rates except traffic but a positive effect on the number of offenses of all types except traffic offenses. These positive effects for numbers of offenses constitute what would appear to be anomalous findings which can only be explained by saying that when all other ecological variables are held constant offenses in sheer numbers occurred more frequently in areas which were still predominantly residential in 1960.

Fairly consistent effects are now found for targets, the higher the density of targets in a neighborhood, the higher the offense rates except for offenses against the person. Targets also had similar significant effects on the number of offenses in neighborhoods. Residential vacancies now had significant positive effects on offenses against persons and property as well as traffic offense rates and significant effects on the number of most offenses. With the exceptions of percent Black and land use, the zero-order coefficients between number of offenses and ecological characteristics were fairly consistent with the path coefficients.

Together, the ecological variables account for significant amounts of the variance in neighborhood delinquency and crime rates, the R&S2's indicating that 46% of all offenses are accounted for by these variables. When number of offenses is considered, even larger amounts of the variance (83% of total contacts) are accounted for.

In a second analysis (which would require another table if described in detail) the 1950 offense rate was added to the analytical scheme as an independent variable for all neighborhoods which had rates in both 1950 and 1960. This permitted assessment of the effects of ecology while holding constant the earlier offense rate and indicates the extent of stability in the offense rate from decade to decade.

The effects of the 1950 offense rates on the 1960 rates were sufficient to equal or exceed the effect of ecological variables on the total offense rate, non-traffic offenses, offenses against property, and traffic offenses, i.e., the prior offense rate had significant effects that were greater than any of the ecological variables for these offenses. In fact, only target density remained as having consistently significant effects on offense rates. It is important to emphasize that these effects are found when the intervening ecological characteristics are held constant and therefore represent the direct effect of the prior offense rate. There were no effects for prior offense rates on offenses against persons, which may be due to the fact that juvenile offenses against persons may be quite different from those involving adults. Finally, the explanatory power of the equations as measured by the R^2 with 1950 rates included (except for offenses against persons) was considerably higher than those shown in Table 6, 74% of the variance for total offenses now being accounted for and ranging to a high of 85% for traffic offenses. Little or no improvement in accounting for number of offenses was made by inclusion of the 1950 rates in the equation (with the exception of traffic of more significant effects did remain for housing scores, land use, and residential vacancies than remained when the analyses were conducted with rates. As a matter of fact, significant effects remained for all ecological variables except percent Black for total contacts.

To summarize, since the effects of 1950 rates are net of the 1960 ecological variables, this indicates that a "tradition" of delinquency and crime has been developing in certain neighborhoods. Furthermore, since few important effects of neighborhood socioeconomic status, racial composition, land use, or residential vacancies remain when other factors are held constant (such as previous offense rate and targets), the notion that a process of "hardening" of the inner city and interstitial areas becomes even more attractive as an explanation of continuities in delinquency and crime rates. In terms of sheer numbers of offenses, however, all neighborhood characteristics except percent Black continue to have important effects on the distribution of delinquency and crime.

The 1970s

Table 7 presents the results of the path analysis of the 1970 offense rates; another 11 peripheral neighborhoods had been added to the analysis as a consequence of city growth. One of the differences from the previous results is the stronger influence of the housing quality score on the offense rates; the higher the quality of the housing in a neighborhood, the lower the offense rate. The coefficients are also significant for every type of offense for number of offenses. For both rates and number of offenses the path coefficients are now quite consistent with the zero-order correlations.

There are still no significant relationships between percent Black and offense rates. The sole significant relationship of percent Black is to number of offenses against persons in the 1970s.[8] This suggests that the commonly accepted view of a relationship between race and crime may instead be one which reflects evolving patterns of neighborhood racial segregation and concentration as well as the dynamics of intergroup relations.

The land use score, as in the 1950s and 1960s, has the expected significant effects on offense rates, although relatively little effect on number of offenses (a positive effect on offenses against the person and status offenses) declining from its effects in the 1960s. Whatever the reason for the varying influence of this factor from decade to decade, it seems clear that a high level of residential land use in a neighborhood has become associated with low offense rates. This is, of

TABLE 7. PATH ANALYSIS RESULTS FOR 1970 COHORT CRIME RATES AND NUMBERS

	DEPENDENT VARIABLES						
INDEPENDENT VARIABLES[1]	Total Contacts	Non-Traffic	Person	Property	Public Disorder	Status Offenses	Traffic
				Offense Rates			
Housing Score	-.339*	-.361*	-.435*	-.198	-.378*	-.532*	-.278*
Percent Black	.058	-.003	.261	.095	.053	.051	.150
Land Use	-.494*	-.426*	-.277*	-.418*	-.389*	-.353*	-.584*
Targets	.151	.206	.053	.376*	.155	.161	.053
Residential Vacancies	-.298	-.253	-.416*	-.474*	-.244	-.342*	-.350*
$\overline{R}^2$ [2]	.370*	.326*	.257*	.303*	.304*	.382*	.437*
				Number of Offenses			
Housing Score	-.614*	-.582*	-.546*	-.301*	-.520*	-.621*	-.641*
Percent Black	.105	.116	.298*	.064	.165	.202	.065
Land Use	.128	.163	.220*	-.016	.159	.275*	.010
Targets	.143	.155	-.032	.479*	.055	-.065	.097
Residential Vacancies	.015	.038	-.037	-.248	.155	-.071	-.059
$\overline{R}^2$ [2]	.484*	.477*	.383*	.253*	.500*	.337*	.415*

[1] The ecological variables were measured in 1970.

[2] R^2 adjusted for degrees of freedom.

* Statistically significant at the .05 level or beyond.

course, one further indication of what we have referred to as the "hardening" of the inner city, a phenomenon which has been taking place at the same time that some high rate and number of offense areas were developing in peripheral residential but transitional areas. In contrast to the 1960s we find that targets have little effect on offense rates or number of offenses other than property offenses. The shift in target locations between 1960 and 1970 is undoubtedly related to this change.

Residential vacancies has a different and unexpected pattern of significant effects on crime rates in 1970 than it had in the 1960s (the signs were negative and indicated that property, person, status, and traffic offenses had higher rates in neighborhoods with low residential vacancies) and no significant effects for number of offenses. This was particularly interesting because the zero-order correlations were low for rates but substantial and positive for number of offenses. Since the path coefficients indicate that the higher the level of residential vacancies, the lower the offense rate, this may be a function of the changing location of vacancies net other characteristics. That is, there was a declining inverse relationship of vacancies to predominantly residential land use by the 1970s, and an even higher overall inverse correlation with housing quality (see Table 1).

Although the R^2 reveals that significant amounts of the 1970s neighborhood offense rate variation was accounted for by the ecological variables, they did not account for as much of the variation as had been accounted for in the 1960s. Similarly, the ecological variables accounted for less of the variation in number of offenses for all types of offenses except those against persons than previously.

Having referred to continuities and discontinuities in rates, it is important to note that there was a significant level of stability in the various offense rates; neighborhoods with a high level of a given type of crime during the 1960s tended to have a high level during the 1970s. The increase in stability was especially apparent for offenses against persons which showed no evidence of stability from 1950 to 1960 but did between 1960 and 1970, the rate for 1960 offenses against persons accounting for 59% of the variance in 1970 neighborhoods. As previously mentioned, however, the earlier finding involved a transition from juvenile to adult offenses.

The addition of the 1960s offense rates increased the amount of the variance that was accounted for to 85% for total offense rates <u>and</u> number of offenses. In every case the effect of prior decade's rate overshadowed the ecological variables even more than when the 1950s rates were added to the equation that accounted for the 1960s rates. This now also became the case for addition of the 1960s rates to the equation for number of offenses in neighborhoods for the 1970s. Only for property offenses did the ecological variables continue to have significant effects.

To summarize, it is clear that neighborhood socioeconomic status, as measured by the quality of housing, emerges as an important influence on the delinquency and crime rates during the 1970s. Neighborhood racial composition is related only to number of offenses against persons. A high level of residential land use is associated with low offense rates but a high number of offenses against persons and status offenses. A high target density is associated only with offenses against property. Residential vacancies show anomalous relationships with most offenses but these may be explained by changes in the location of high vacancy areas which have not been consistent with changes in offense patterns. Finally, there is evidence of considerable stability in the delinquency and crime rate, net of ecological characteristics, from the 1960 to the 1970 decade (as there was at the zero-order level). The explained variances for rates with prior rates included are even higher than for the 1960s with the 1950s included. The total explained variances for number of offenses are also about as high or higher than for the 1960s.

The next logical step was to conduct the same analysis but to include offense rates for the 1950s and 1960s in order to ascertain the cumulative effect of these rates on the 1970s rates, followed by inclusion of both rates and the ecological characteristics of neighborhoods to determine the extent to which all could account for variance in the 1970s rates. This analysis included, of course, only those 47 neighborhoods for which offense rates had been ascertained for three time periods. Rates for the 1950s and the 1960s accounted for 81% of the total contact rates, 88% of the non-traffic rates, 83% of the public disorder rates, but only 41% for traffic offenses. These figures lend further evidence to the position that considerable continuity has persisted in the pattern of high and low offense rates in those neighborhoods of the city which have been in existence over the years. When the ecological variables were added, 92% of all offenses were accounted for, as were 93% of the non-traffic, 90% of the traffic, 88% of the public disorder, 87% of the property, 69% of the offenses against persons, and 58% of the status offense rates. The ecological variables which remained of considerable significance were land use and residential vacancies.

It is clear from these results that there is no single dimension of neighborhood ecology which acts as a consistent, powerful predictor of delinquency and crime rate(s) or number of offenses over time. Nonetheless, most of the relationships which do appear are more or less consistent with previous ecological analyses. For example, the importance of neighborhood housing quality in its influence on 1970 crime rates is consistent with a class interpretation of ecological crime differences. However, this did not appear in either of the earlier decades and is not consistent with more recent findings at the individual level which suggest a problematic class differential over time.[9]

There are several plausible explanations for these findings. For example, it is possible that measurement error has caused estimates of the path coefficients to fluctuate from period to period. Although we do not believe that this accounts for the variations in the observed effects over time, this will be dealt with more directly in a moment. The fact that we have utilized three time periods and have examined rates and number of offenses and both with prior rates included and excluded and have still found significant effects with some continuity as well as discontinuity suggests that there are important effects that change with changes in the social organization and ecology of the city.

Another possibility is that multicollinearity among the independent variables causes some fluctuation in the estimates. We have previously discussed the correlation between the housing quality factor score and percent Black in this context. During the 1950 period this correlation was -.486. It was -.584 during the 1960 period and -.531 during the 1970 period. Thus, while there is some variation in the source of multicollinearity, it would not account for the apparent reversal of the relationship between percent Black and offenses against persons from the 1960 to the 1970 period, although other relationships may account for it.

From a more substantive point of view, the data reflect temporal changes in the relationship between ecological structure and crime.[10] In addition, as we have argued elsewhere, there appears to be a "hardening" of the ecological structure over time, more specifically a hardening of the inner city. This is especially apparent where inner city areas experience a loss of population and residential land use, and where patterns of racial segregation have become entrenched.[11] Indeed, one might speculate that the meaning of residential vacancies in a "hardened" ecological context is different from that in more fluid, developing areas. Residential vacancies are possible in any areas where residential units exist but taking residential vacancies as a measure of transiency and postulating an invariant relationship between transiency and crime over time is not consistent with our data.

Because we were concerned about the possibility that measurement error for rates could influence the findings it was decided that rates derived in three different ways (rates based on the census population of each neighborhood at the start of each time period; rates based on the mid-decade census population; and rates based on the number of persons from each cohort who resided in the neighborhood during each decade) should be compared. Would the findings be consistent for total police contacts when the findings from each of these rates are compared?

The results are presented in Table 8. With one exception for each time period there are significant path coefficients for the 1950s and 1960s for land use and target density regardless of the delinquency rate utilized. The shift from land use became less important as a significant determinant and targets became more important. Percent Black and housing scores decline in importance when the basis for calculating the rates is mid-decade

TABLE 8. PATH ANALYSIS RESULTS FOR 1950, 1960 AND 1970 COHORT TOTAL OFFENSE RATES BASED ON NEIGHBORHOOD POPULATION AT START OF 10-YEAR PERIOD, AT MID-DECADE, AND ON NUMBER OF COHORT MEMBERS RESIDING IN NEIGHBORHOOD

	Residential Vacancies	Land Use	Targets	Percent Black	Housing Score					
	Independent Variable Path Coefficients[1]							*Explained Variance*[2]		
								Ecology $\bar{R}^2$		
1950 Rates										
Start	.030	-.572*	.102	-.260	-.281			.337*		
Mid-decade	.014	-.673*	.317*	-.215	-.162			.496*		
Cohort	.030	-.487*	.444*	-.192	-.087			.295*		
1960 Rates										
Start	.248	-.300*	.419*	-.147	-.053			.457*		
Mid-decade	.259	-.292*	.403*	-.074	-.033			.470*		
Cohort	.249	-.075	.607*	-.247	.045			.412*		
1970 Rates										
Start	-.297	-.494*	.151	.058	-.339*			.370*		
Mid-decade	-.257	-.473*	.140	.023	-.340*			.338*		
Cohort	-.074	-.323*	.246*	-.182	-.322*			.227*		
1960 Rates						1950 Rate			1950 Off. Rate $\bar{R}^2$	1950 Rate + Ecology $\bar{R}^2$
Start	.121	-.177	.416*	-.101	-.008	.550*			.499*	.738*
Mid-decade	.188*	-.008	.286*	.018	.076	.694*			.756*	.842*
Cohort	-.011	.023	.266*	-.105	.060	.853*			.879*	.920*
1970 Rates						1960 Rate			1960 Off. Rate $\bar{R}^2$	1960 Rate + Ecology $\bar{R}^2$
Start	-.162	-.189*	-.058	.170*	-.083	.816*			.802*	.850*
Mid-decade	-.061	-.147*	-.052	.098	-.022	.891*			.900*	.923*
Cohort	-.100	-.254*	.047	.083	-.036	.879*			.852*	.925*
1970 Rates						1950 Rate	1960 Rate		50-60 Off. Rate $\bar{R}^2$	50-60 Rate + Ecology $\bar{R}^2$
Start	-.225*	-.306*	-.098	.139*	-.115	-.004	.809*		.814*	.923*
Mid-decade	-.063	-.237*	-.080	.074	-.111*	.015	.855*		.906*	.962*
Cohort	-.087	-.269*	.044	.035	-.044	.307*	.582*		.895*	.963*

[1] The independent ecological variables were measured in 1950, 1960, and 1970.

[2] All R^2 adjusted for degrees of freedom.

* Statistically significant at the .05 level or beyond.

procedures but others were different depending on whether the entire cohort or only those with police contacts were considered. This is part of the problem of deciding which measure best captures the phenomenon in which one is interested.

Perhaps the best way to illustrate this type of age group, cohort progression is to present the percent who have had police contacts and mean seriousness scores (all cohort members and only those with contacts) for Tract 3, one of the inner city tracts with high seriousness scores (see Table 6).

No matter which of the sub-tables in Table 6 is considered, this tract comes close to the A model in Diagram 1 or, if not an A, it is surely a B, as in the case of seriousness of those with contacts. It is this type of census tract with which persons on the firing line are concerned. Inner city Tracts 3, 4, and 5 followed this pattern, although the within-age-group cohort transition from lower to higher seriousness scores was not perfect for the 6 through 10 age group. No other tracts fell in this pattern. Tract 2, which was supposed to be a transition tract, showed declining seriousness (we have described this tract and reasons for its patterns previously) but was even closer to showing no pattern. Tract 13 showed late cohort transition, indicating that it was becoming like the inner city. Other tracts showed a variety of patterns with low seriousness and little or no progression.

Similarly, three of the four inner city police grid areas (12, 13, and 16) fell in pattern A or B and 8 was best or cohort population. Turning to the 1970 data, land use again becomes the most significant determinant and housing score replaces target density as a significant ecological variable. One must note, however, that the pattern of coefficients does vary somewhat depending on the rate utilized even though there is considerable consistency in which variables produced statistically significant coefficients.

When the 1950 offense rates were included in the 1960 analysis they overshadowed the ecological variables regardless of the offense rate utilized; in fact, there was relatively little more of the variance accounted for by the ecological variables (targets remained the only variable with significant effects) than was accounted for by prior offense rate.

When first the 1960 and then the 1950 and 1960 offense rates were included in the 1970 analysis, land use continued as the only ecological variable with significant effects regardless of rate utilized. Although there were some irregular significant differences in the effects of the ecological variables, the high percentage of the variance accounted for by prior rates was quite consistent regardless of rate utilized. That 85% to 95% of the variance was accounted for in all cases for the 1970s when prior rates and ecology had been introduced gave added strength to ths position.

SUMMARY OF THE PATH ANALYSES

We have presented a multivariate analysis of the interrelationships among various indicators of delinquency and crime and ecology at the neighborhood level of analysis. These analyses are important because they show the influences (or lack of them) of the independent "causal" variables net of other variables in the model over an extended period of time. The analyses, as conducted, also operationalize some of the major theoretical concepts employed in various ecological studies of juvenile delinquency and crime. In addition, the total offense rate was decomposed into various components to ascertain whether or not there were systematic differences in the way the various dimensions of ecology related to different types of delinquency and crime at the aggregate level.

Although the effects of ecology on delinquency and crime were generally consistent with previous theory and research, the patterns found differed from period to period. A high level of residential land use was associated with a low offense rate during each decade but there were less consistent effects for housing quality on delinquency rates during the 1950s, practically none on delinquency and crime during the 1960s, followed by the emergence of more consistent effects during the 1970s. Significant effects of targets were greatest during the 1960s while residential vacancies had effects in both the 1960s and 1970s. In sum, there were changes in the relationships between ecological structure and delinquency and crime during the period(s) that the city had been experiencing the transition from a generally low delinquency and crime rate to a high delinquency and crime rate.

We have elsewhere reported that analysis of the effects of crime on the subsequent ecological characteristics of the neighborhoods where the crime occurred shows that any such effects are scattered and weak at best.[12] It is evident that the relatively simple kinds of ecological effects many persons have come to accept as sure consequences of spatial continuities in delinquency and crime are much more complex. Oversimplification leads to conclusions which may point to oversimplified solutions to the problems of delinquency and crime. Although the effects of high offense rates on the ecology of the community may be quite modest, this is not to say that individuals who must live and work in high crime areas do not perceive and react to that crime.[13]

That there has been a hardening of the inner city at the same time that delinquency and crime rates have been increasing in some more peripheral and outlying areas is clear.

FOOTNOTES

[1] The appearance of Robinson's influential treatise on the "ecological fallacy" (William S. Robinson, "Ecological Correlations and the Behavior of Individuals," _American Sociological Review_, Vol. 15, June 1950, pp. 351-357) raised doubts in the minds of many researchers as to the viability of aggregate-level research but since that time, as pointed out by Schuech (Erwin K. Scheuch, "Social Contact and Individual Behavior," pp. 133-155 in Mattei Dogan and Stein Rokkan (eds.), _Quantitative Ecological Analysis in the Social Sciences_, Cambridge, Mass.: M.I.T. Press, 1969), the ecological fallacy has been shown to be one instance of a family of cross-level observations including the "individualistic fallacy" (i.e., inferring the behavior of aggregates from observations on individuals). In addition, a number of statistical treatments (Leigh Burstein, "Assessing Differences Between Grouped and Individual-level Regression Coefficients," _Sociological Methods and Research_, Vol. 7, August 1978, pp. 5-28 and Michael T. Hannon and Leigh Burstein, "Estimation from Grouped Observations," _American Sociological Review_, Vol. 39, June 1974, pp. 374-392) have clarified the direction and nature of biases in parameter estimates under different conditions of aggregation.

[2] Brian J.L. Berry and John D. Kasarda, "The Social Areas of the City: From Classical to Factorial Ecology," _Contemporary Urban Ecology_, New York: MacMillan, pp. 108-157.

[3] Roland J. Chilton, "Continuity in Delinquency Area Research: A Comparison of Studies for Baltimore, Detroit, and Indianapolis," American Sociological Review, Vol. 29, February 1964, pp. 71-83.

[4] Rates have been computed in a variety of ways: 1) the number of offenses in a neighborhood was divided by the census population of the neighborhood at the beginning of the period; 2) the number of offenses was divided by the census population at mid-period; 3) the number of offenses was divided by the number of cohort members residing in the neighborhood during the 10-year period. During the 1950s the two rates based on census populations had a Pearsonian coefficient of correlation of .852. The beginning census population correlated with the cohort population based rates .771 and the mid-period rate correlated with the cohort population based rates .895. For the 1960s the correlations were .988, .921, and .907. For the 1970s the correlations were .994, .907, and .926.

[5] Delbert S. Elliott and Suzanne S. Ageton, "Reconciling Race and Class Differences in Self-reported and Official Estimates of Delinquency," American Sociological Review, Vol. 45, February 1980, pp. 95-110, and John W.C. Johnstone, "Social Class, Social Areas and Delinquency," Sociology and Social Research, Vol. 63, October 1978, pp. 49-72.

[6] Michael J. Hindelang, "Race and Involvement in Common Law Personal Crimes," American Sociological Review, Vol. 43, February 1978, pp. 93-109.

[7] Lawrence E. Cohen and Marcus Felson, "Social Change and Crime Rate Trends: A Routine Activity Approach," American Sociological Review, Vol. 44, August 1979, pp. 588-608.

[8] Research designed to answer questions at the individual level may or may not produce different findings from research designed to answer questions with aggregated ecological data. When Blau and Blau recently investigated violent crime with 1970 data for the largest 125 American metropolitan areas they found that socioeconomic inequality between races, as well as economic inequality in general, increases rates of violent crime. When economic inequalities are controlled the proportion of Blacks in a metropolitan area has little influence on the rate of violent crime. Judith R. Blau and Peter M. Blau, "The Cost of Inequality: Metropolitan Structure and Violent Crime," American Sociological Review, Vol. 47, February 1982, pp. 114-129. Also see: A.D. Watts and T.M. Watts, "Minorities and Urban Crime: Are They the Cause or Victims?" Urban Affairs Quarterly, Vol. 16, June 1981, pp. 423-436 and D.W. Roncek, "Dangerous Places: Crime and Residential Environment," Social Forces, Vol. 60, September 1981, pp. 74-96.

[9] Charles R. Tittle, Wayne J. Villemez, and Douglas A. Smith, "The Myth of Social Class and Criminality: An Empirical Assessment of the Empirical Evidence," American Sociological Review, Vol. 43, October 1978, pp. 643-656.

[10] As suggested by Leo Schuerman and Solomon Kobrin in "Ecological Processes in the Creation of Delinquency Areas,"

paper presented to the Seventy-Sixth Annual Meeting of the American Sociological Association, Toronto, August 26, 1981.

[11] Darden, for example, has shown that racial segregation has remained at a high level in Pittsburgh from 1930 to 1970. Although considerable change in residential segregation by census tracts took place between 1930 and 1970, racial change occurred only in tracts that were less than one percent segregated at the outset. Joe T. Darden, Afro-Americans in Pittsburgh: The Residential Segregation of A People, Lexington: D.C. Heath, 1973. While some blocks and neighborhoods in Racine without Black residents in 1950 had them by 1960 and even more by 1970, most inner city blocks that were Black remained Black and some became even more so if they continued to be residential blocks. We are, of course, referring to more than residential segregation when speaking of the "hardening" of the inner city and refer to its physical characteristics and its offense rates as well.

[12] Lyle W. Shannon, The Relationship of Juvenile Delinquency and Adult Crime to the Changing Ecological Structure of the City. Final Report to the National Institute of Justice, Grant Number 79-NI-AX-0081, October 1981.

[13] Wesley G. Skogan and M.G. Maxfield, Coping with Crime: Individual and Neighborhood Reactions. Beverly Hills: Sage Publications, 1981.

Chapter 10. Summary of the Research and Recommendations

SUMMARY

Inherent in any research on the relationship of juvenile delinquency and adult crime to the changing ecological structure of the city, a structure influenced by the organization of society, is the premise that delinquency and crime are products of the ongoing social life of the community. Rather than delinquency and crime having some single or underlying antecedent or cause, different types of delinquency and crime are generated in different social milieus and are as normal to their setting as other behaviors more highly valued in the larger society.

In the first chapter it was shown that measures of delinquency and crime neither rose nor fell with fluctuations in Racine's economy or in a pattern lagging somewhat behind economic trends. Crimes against property, neither property offenses in general nor theft alone, followed unemployment rates or other measures of the economy's ability to provide jobs so as to support an economic cycle or trend explanation of the crime rate in Racine.

We later, of course, found that crime rates were highest in those inner city and interstitial areas whose residents are employed at lower level jobs, who are unemployed more frequently than persons from other areas, and whose youthful members are less integrated into the world of rewarding work or work at all than are youth from other areas of the city.

It was apparent that the city had undergone rapid growth during the 1950s, growth that carried on into the 1960s, and that this growth had been accompanied by increasing individual mobility, as evidenced by automobile registrations and traffic counts, both of which had increased disproportionately to the city's population growth.

Numerous other changes in the social organization of the community had taken place. As Racine's residential and commercial-industrial areas grew it became obvious that many of the changes taking place could lead to increased involvement of the police with both juveniles and adults. The more that the growth and development of the city was considered the easier it was to see how delinquency and crime became part of a cyclical pattern of change which, while it involved decline and deterioration in the inner city and interstitial areas, was likewise an outgrowth of population movement to and commercial and recreational development in peripheral areas, readily accessible by auto or bus. Rather than be surprised and mystified by increases in delinquency and crime and changing spatial patterns for these phenomena, the observer sees them as natural and expected developments.

Having recognized the cyclical nature of the phenomena, the next step was to develop an understanding of the complex interrelationship of variables that keeps the process going. Not until more is known about this process and the crucial variables can we effectively go about breaking the cycle of decline, deterioration, delinquency, crime, further population movement, and so on. We must also be aware that the problem may be conceptualized at a level which would preclude action, e.g., if the problem is approached in such a way that the only conclusion is that the whole society must be reorganized, little or no advice may be given to those who deal with youth on a day to day basis. At another level of conceptualization, although not likely to occur when the problem has been placed in an ecological framework, focus is on the individual and his/her behavior so that programs aimed at breaking the cycle aim at breaking the delinquent and criminal. This type of approach, on which we shall later comment more fully, makes the error of assuming that if the delinquent and criminal elements are removed from the community the cycle is broken. It disregards the normality of most delinquent and criminal behavior, behavior which will continue to be a part of community life because others will take the place of those who are removed.

Setting the stage for an approach that would lead to a better understanding of the trends and cycles was our central concern in the first chapter. Our second concern was methodological. We had proposed that a variety of spatial systems or sets of units should be utilized to determine if the same findings are made regardless of unit of measurement. Since the literature has been replete with contradictory findings, would we have the same experience if the results of research with a variety of units were compared: census tracts, police grid areas, natural areas, and neighborhoods? Would neighborhoods present a more precise picture of changing patterns of delinquency and crime and also be more sensitive to changes in the social organization of the community than larger spatial units?

In the second chapter the various spatial systems were presented and, on a basis of their social, demographic, residential, and land use characteristics, placed in groups that were hypothesized to range from high delinquency and crime areas to low delinquency and crime areas. There was considerable emphasis on the delineation of the interstitial or transitional areas. At the same time, the heterogeneity of spatial units within groups and heterogeneity within the spatial units themselves was recognized as a problem. While it was apparent that some of the within-area heterogeneity could be related to race/ethnic differences, there was also considerable heterogeneity within race/ethnic groups. All of this would be sure to reduce the likelihood that juvenile delinquency and crime rates and changes in rates of delinquency and crime would be arrayed in the same order that was developed for the units within each spatial system.

Since our approach commences with the assumption that a model derived from urban growth and development theory should permit the generation of predictions of delinquency and crime rates and changes, the general effectiveness of this approach was first tested. The chapter concluded with the inner city and interstitial areas of each system delineated and with other areas grouped to achieve maximum within-group homogeneity on the characteristics which have been hypothesized to either provide a milieu for in-area delinquency and crime or produce it among residents of the area. That the areas in each spatial system were of different sizes and created similar but not identical inner city and interstitial areas guaranteed that there would be differences in the findings from one system to the other. At the same time, the general process of change should generate similar findings when identical measures of delinquency and crime are utilized.

The third chapter was essential but probably not exciting save to those who are really interested in measurement problems. It was considered important to discriminate between in-area offense rates and rates based on offenses by the residents of areas, wherever they might take place. Earlier research with the cohort data had shown that people from some areas had police contacts not only in their area of residence and adjacent areas but ranged far from their abodes in pursuit of their delinquent and criminal activities. The earlier study had also shown that some areas attracted people from every other area in the community but that others had far less drawing power. From a substantive standpoint, the movement of population from the inner city and interstitial areas to outlying areas, particularly the disproportional movement of the younger groups, had resulted in significant changes in the age-group composition of those who had been arrested in some areas during the years covered by this research. This phenomenon alone would have an impact on the spatial distribution of delinquency and crime. While this phenomenon is not unique to Racine, it was believed that documentation of the movement and its impact on delinquency and crime rates would keep this important aspect of changing patterns of delinquency and crime in the mind of the reader.

The stage had now been set for Chapter 4's analysis of Racine's changing rates and patterns of Part I Offenses by place of offense for census tracts (1970 through 1978) and police grid areas (1968 through 1979) and arrests for Part I and II Offenses by place of residence in census tracts (1968 through 1979). The police contact, referral, and court experiences data for the three birth cohorts were also described.

The description of trends in of Chapter 4 was non-statistical in the sense that the metric variables had been trichotomized in order to produce tables which would readily indicate if offense and arrest rates were related to the ecology of the city. It was obvious that high offense and arrest rates were characteristics of the inner city and interstitial areas and that low rates were (with explainable exceptions) associated with the middle and higher socioeconomic status areas on the periphery of the city; however, the heterogeneity of other areas in Racine resulted in the production of a pattern that was far from perfect. At the same time, it was also clear that progression in offense and arrest rates from the inner city and interstitial areas had taken place and that changes in the characteristics of tracts and police grid areas were related to them.

The pattern of change was not the same for all variables selected nor could one discern a neat pattern of cyclical change in variables from time period to time period. Instead, there were a variety of combinations and permutations characterizing the tracts and grids between the inner city and the highest socioeconomic status areas on the periphery. It was clear that while offense rates and arrest rates were rising throughout most years of the study, they commenced to decline in 1974 or 1975, even in the inner city.

It was also apparent that trends in offense and arrest rates of an historical nature overshadowed the trends that were expected in some tract and police grid areas. This does not mean that the model of expected spatial variation in rates has been rejected, only that the cyclical phenomenon is best seen in the inner city and interstitial areas and that the rates in other areas may be more of a response to general trends than to other changes within the area.

The analyses described in Chapter 5 verify what had been tentatively concluded in Chapter 4, the existence of continuity in relationships between the characteristics of areas and arrest and offense rates. It also revealed some, but inconsistent, temporal increases in the strength of the relationship between the characteristics of tracts and grids and their appropriate arrest and/or offense rates. But while the relationships between target density and arrest and offense rates was consistently high in the census tract analysis, this same variable produced a much lower relationship for place of offense by police grid areas. Housing quality scores also had high correlations with arrests and offenses by tracts but lower correlations by place of offense for police grid areas. Percent of land devoted to commercial-industrial use, however, produced similar correlations for both the tract and grid analyses during the same time periods. Thus, some variation in findings exists depending on the spatial units of analysis.

The second aspect of the findings reported in this chapter that was disturbing was the inconsistency, quite aside from temporal or spatial unit inconsistencies, with which arrest rates for tracts and offense rates for grids correlated with the characteristics of areas. As we stated, however, the small number of tracts and police grid areas would tend to produce this fluctuation. The third finding that bears mention in the summary is that offense change rates were inconsistent between tracts and grids. Moreover, when the metric for change rates was held constant at the start of the change period relatively low correlations were produced, meaning that the dynamic aspect of the model was not very great--change added little to the proportion of the variance that was accounted for by the characteristics of areas at the beginning of the change period.

This brings us to Chapter 6 in which cohort data were used in comparing the results which would be obtained by analyzing the same data set within each of the spatial systems. The emphasis was on cohort time period change (by place of contact and place of residence) by the units of each spatial system. We were concerned, not with simply whether police contact rates, seriousness rates, referral rates, and severity of sanctions scores were highest in the inner city and lowest in the peripheral areas and for those who resided there, but with whether those inner city and interstitial areas and their residents could be characterized as having progressively higher rates, time period by time period.

Some of the interstitial and other transitional areas were quite obviously much like the inner city and others were not as sharply differentiated from the stable residential areas of the community but there was variation depending upon the basis for computing rates or the measure of involvement with the police and justice systems. This led us to refer to the hardening of the inner city that appeared to be taking place at the same time that delinquency and crime were increasing in some other areas, particularly if rates for the 1970s were considered. Finally, there was a strong suggestion that when measures of serious involvement were observed the hardening was even more apparent.

A dynamic model of cohort and age period change was introduced in Chapter 7 in order to better answer the question of change in police involvement from cohort to cohort synonymously with age group (and, of course, underlying it, time period) change.

As in each of the other analytic approaches it was found that inner city areas were generally distinctly different from other areas (with the exception of some transitional areas). The areas in each system that had been characterized as interstitial or transitional were generally more similar to the inner city areas than were the remainder, but not all fit one of the transition models that had been proposed. Most other areas revealed little evidence of transition in police contact rates, seriousness rates, referral rates, or in severity of sanctions scores.

If the inner city tract, grid, natural area, or neighborhood with the highest rates was selected, each was very similar to the other in their age group and cohort by cohort pattern. If peripheral areas were selected from each spatial system, their age group and cohort characteristics were similar. It is only when offense rates and arrest rates or other measures of delinquency and crime for all areas in a system are correlated with measures of residential housing quality, land use, target characteristics of areas, and so on, that significant differences in the amount of explained variance develop. We conclude that the basic process of diffusion of delinquent and criminal behavior is ongoing, but perhaps captured better by spatial systems developed for demographic and statistical purposes or to encapsulate relatively small homogeneous areas than by arbitrarily drawing horizontal and vertical lines as was done in the construction of police grid areas.

Our concern with the trend toward hardening of the inner city led to further examination of the data, first in terms of the proportion of each cohort who had contacts with the police at each age in the areas within each spatial system and second in terms of the linkage between high seriousness rates in areas, age group by age group, as seriousness built up in each cohort. Both approaches provided further evidence of this hardening for it was in the inner city areas that continuity remained and it was evident that seriousness of reasons for police contact had uniformly high ecological correlations for the 1949 and 1955 Cohorts from age group to age group, particularly during the ages 15 through 17 and 18 through 20. Areas with high mean seriousness scores by members of the cohort residing there continued to have high mean seriousness scores and to the extent that these correlations were not higher it was because seriousness of reasons for police contacts had at the same time increased in some interstitial and peripheral transitional areas.

When, as described in Chapter 8, the mean seriousness of all earlier age groups was regressed on seriousness 18 through 20 the impact of ages 15 through 17 on later ages was significant for three out of four spatial systems. Added to that an analysis of mean seriousness scores before and after moves confirmed the generally deleterious effects of movement to lower SES areas, most of which involved moves to the inner city or transitional areas which had increasing delinquency and crime rates. This section concluded with an analysis which showed that sanctions fail to have a deterrent effect on the future behavior of persons who reside in areas which receive the most severe sanctions.

The remainder of Chapter 8 was devoted to several matters that had not been fully dealt with in earlier chapters. A comparison of official rates for several Racine offense and arrest series for the 1970s and several cohort contact, referral, and seriousness of offense series for the 1970s revealed that tract and grid rates were highly correlated, whichever measures were utilized. The importance of considering the effects of changing traffic patterns and the ready accessibility of peripheral areas or inner city areas to persons who reside at a distance from either was also noted as a factor that must be recognized if changing patterns of delinquency and crime are to be fully accounted for.

The strategy in Chapter 9 was to turn back to the original hypothesis that had guided most of the analyses in order to determine the extent to which cohort delinquency and crime rates in neighborhoods were affected by the ecologial characteristics of the neighborhoods and how these delinquency and crime rates might in turn affect delinquency and crime rates of neighborhoods in a following period. These analyses were crucial because they revealed the influences of the hypothesized causal factors net other variables in the model and incorporated the influences of delinquency and crime during the 1950s and 1960s in accounting for neighborhood delinquency and crime in the 1970s.

While the ecological characteristics of neighborhoods had significant effects on various crime rates and the total delinquency and crime rate, these effects were not constant over time. They were, however, generally stronger than the effects of crime on ecological characteristics, which were not only weak but inconsistent over time. Perhaps most important, and consistent with findings by other researchers, was the relationship between several ecological variables indicative of social class and delinquency and crime rates. In sum, there were changes in the relationships between ecological structure and crime during the period(s) when the city had been experiencing the transition from generally low delinquency and crime rates to high delinquency and crime rates.

When delinquency and crime rates for the 1950s and 1960s were included in the analyses there was even more solid support for the position that there has been a hardening of the inner city at the same time that delinquency and crime rates have been increasing in some more outlying areas. In fact, prior offense rates in neighborhoods had even stronger effects on delinquency and crime rates of neighborhoods in the 1970s than did the ecological variables.

WHAT DOES IT MEAN?

These are the basic findings. What do they mean to persons on the firing line? More than 30 years ago the project director presented to a group of correctional workers a paper on the spatial distribution of each of the Part I Offenses by states and regions in the United States. This research, as had other research for earlier periods utilizing the Uniform Crime Reports, indicated that there were different spatial patterns of crime for each of the Part I Offenses. These patterns were meaningful to any sociologist or social scientist with knowledge of regional variation in the organization of work, cultural differences in ways of dealing with life's problems, how the distances between places of importance vary, degrees of urbanization and urbanism, in fact, what one might say are enormous variations in people's ways of life or approaches to life from one region of the country to the other. Furthermore, the findings could be and were considered evidence of the futility of attempting to deal with the crime problem by sanctioning or otherwise attempting to change individuals.

The crime problem was obviously more complex and deep-rooted than commonly considered. It was not simply one which had its genesis in miscreants who, for one reason or another, could not conform to society's definitions of appropriate behavior. It was not a matter of hired killers or sadistic murderers scattered here and there throughout the country. It was not just a matter of individual avarice and greed. Nor could it be said that patterns of crime were related to regional variations in skull thickness, nostril width, endocrine imbalance, overconsumption of jelly rolls (this has been seriously proposed at criminology meetings even within the past few years), or the lack of corrective eye glasses and shoes (which has also been proposed and received more publicity than some scientifically grounded sociological explanations). This and other research conducted in an ecological framework put to death and, it was believed, had interred for all time the idea that attention should be focused on the individual. This is not to say that individual variation within a given space does not occur (we have spoken of heterogeneity within areas) but if there are persisting significant differences in crime on a regional basis then is it not folly to commence the "war on crime" by aiming at the individual whom we know will be replaced by another from the same area tomorrow?

But to shorten a long story somewhat, the correctional people said that the research was all very interesting, but so what? How would it help them? To be sure, there was nothing in the paper that would improve upon isolation therapy as a way of dealing with the most unrepentant troublemaker in the institution and at least bringing about, if only temporarily, a measure of tranquility inside the walls.

This paper did provide a reaffirmation of the idea that criminal behavior is one of the varieties of human behavior. However reprehensible it may seem, certain types of misbehavior are not entirely abnormal in certain settings and can be understood as an outgrowth of interaction with others in the larger social milieu or in a smaller social milieu which is a variant of the larger. Unless one commences with some understanding of this, then what could really be understood seems only to be hopelessly incomprehensible, aberrant behavior. When the juvenile ceases to misbehave by the age of 18 or, as in most cases, by the age of 21, his/her explanation of "why" substantiates the normality of most earlier misbehavior.

My reply was then and still is that correctional people will do a better job (not as much harm) if they understand how crime comes about in various settings. They will not be so inclined to see themselves as zoo keepers, however much that may seem to be their role in darker moments. It is just as important that the guard on the wall and the cell block custodian understand this as it is for the warden and the deputy warden to do so. Breaking the outlaw may appear necessary if the warden is to keep his job but has little or nothing to do with the crime problem in America. It is just as important that the heads of executive branches of government, the legislative branch (senators, congressmen, and their administrative assistants), and the judicial branch understand this if they wish to be effective in their approach to the problems of delinquency and crime.

This is the broader view of the problem. While it may seem philosophical, it is not. This position is an outgrowth of research that has been conducted at the lowest level (that is, closest to misbehavior by the self-report method and by victim surveys) and at the highest level which involves the analysis of Uniform Crime Reports for the entire United States for lengthy periods of time. The most sophisticated multivariate statistical types of analyses and interviews with participants in barroom disturbances (rousers) culminate in essentially the same conclusion, that understanding how delinquent and criminal behavior comes about is the first step to learning what to do about it.

For some years (perhaps since the time that the pyramids were built) varying proportions of the population have professed the almost certain "knowledge" that increasing youthful and adult misbehavior (however it has been characterized) must be followed by swift and sure action. There are others who would commence with leniency and understanding but if that does not bring forth repentance and cessation of delinquent and criminal behavior, turn to punishment as the appropriate remedy. While punishment may not always be in vogue, sanctions whose severity may go as far as institutionalization, incarceration for adults (incapacitation is popular now) is considered the final step. While no research exists which supports the effectiveness of such an approach, there is abundant evidence that programs directed at the offender (juvenile or adult) neither deter potential offenders because they fear the same thing will happen to them nor serve as corrective measures for those who are sanctioned.[1]

With increasing concern about the problem the danger lies in presuming that a policy of increasingly severe sanctions will serve as a deterrent. The ecological and other data suggest that this is not correct--if sanctions have a deterrent effect the consequences should be seen and responded to in the area where the sanctioned person is known. There is little evidence of this.

So, the meaning of the findings is that areas of delinquency and crime are being solidified. The position that there is a cyclical type of process with areas changing in all major respects followed by increasing delinquency and crime probably overstates the case. If a variety of indicators are selected some will account for more of the variance than others in one spatial system and others will account for more of the variance in another spatial system, and, of course, some will appear to be powerful determinants no matter which spatial system has been selected. Another error is to conclude that if a characteristic seems to account for much of the variance no matter which spatial system has been selected it is a specific causal variable when it may well be that it is simply one of many indicators of something more general that is present in the area, something which lies behind the indicator and is the real antecedent of delinquency and crime, the factor that is basic to the cyclical process with which we are concerned.

That target density and residential vacancy accounted for significant amounts of the variance in offense and arrest rates by census tracts and police grid areas tells us that a large segment of the offenses in an area are probably target-related, directly or indirectly, and that arrest rates by place of residence are also high in these areas. It does not tell us that a policeman at the door of every store is the answer, that transforming taverns into fortresses which admit only known customers, that a soldier on every corner, and so on, will reduce or eliminate offenses and arrests. Studies which focus on the activities of people in small areas tell us how delinquency and crime develop in these areas and how various types of establishments become targets.

Similarly, that residential vacancy is high and becomes higher in these areas does not tell us that eliminating residential vacancies will have an impact on delinquency and crime rates. (Residential vacancies in an outlying, developing area mean one thing and in the inner city and transitional areas another.) It is what these vacancies represent that is most important. In some areas they represent an attitude and a change in population and population composition that are those aspects of an area that make delinquent and criminal behavior more normal or at least more available as alternate forms of behavior.

Cities grow and develop and there are always residential and commercial vacancies. The locations of targets change and, while large areas of vacant buildings are undesirable, people are going to take their places of business to areas where people are or where they are expected to be very shortly. It is, therefore, an oversimplification to take the results of the research literally and to assume that whatever differences in housing or other variables are found between the inner city and interstitial, high delinquency and crime rate areas and other areas should be eliminated as a solution to the problem of delinquency and crime. In the first place, it couldn't be done.

WHERE TO BREAK THE CYCLE

Large areas of major cities are wastelands and for a multitude of reasons it would be desirable to see them rebuilt whether or not this impacts on delinquency and crime.[2] It can be argued that the long-run costs of not rebuilding the inner city will be greater than the short-run costs of attacking the problem now. If crime and delinquency rates show significant decline, so much the better. But what can be done short of revitalization of the inner city and transitional areas as a basic step toward changing people's lives in these high delinquency and crime areas?[3]

Probably the most reasonable step at this time would be to slow down the trend toward official handling of juvenile delinquency and youthful crime, i.e., encourage street-level handling of minor offenses and other informal dispositional alternatives rather than referral to the juvenile bureau or the juvenile court intake. This involves training police officers to better understand human behavior--not as a substitute for the training that they must have in how to deal with violent offenders, of course. Official statistics on police contacts and referrals generate a societal response as it is and the more that juveniles are contacted and referred (and this will happen more in areas that are defined as delinquent and criminal areas), the greater the attention to that area will be. As the composition of the population changes and more youth and minority groups reside in transitional areas adjacent to or close to the inner city or areas whose land use and other physical characteristics mark them as "new slums," the more likely attention will be focused on their youthful misbehavior. That will speed up the cycle in the area.

The second step would be to resist the argument of those who believe that increasing the severity of sanctions and sanctioning a greater proportion of the youth earlier will have a favorable impact on the problem of delinquency and crime. If severe sanctions are followed by increasingly serious delinquency and crime, this too speeds up the cycle for this serious delinquency and crime is followed by even more severe sanctions. Areas of delinquency and crime are further distinguished from other areas of the community as the population continues to leave them. As some areas become more and more different from others, subcultural differences increase and socially acceptable patterns of behavior, particularly among youth, become more diverse. The rationale for delinquency and crime is there and the socialization of youth into the larger society becomes increasingly difficult.

A third step would be to determine through social accounting how extensive the savings from such a policy would be (in the billions every year if the trend toward severity of sanctions continues). It is not just the cost of institutionalization with which we are concerned but the cost of processing from time of referrals (including detention and court dispositions) that must be taken into consideration. While the cost to victims is sometimes incalculable, it is also sometimes very small--stolen wheelcovers, etc. The cost of crime other than what has sometimes been called "the ordinary garden variety," i.e., the sometimes multimillion dollar cost to financial and investment institutions of a single sophisticated offense must also be considered if we are truly interested in the "cost" of crime. This cost in lost confidence in major societal institutions may be just as incalculable as violence against persons.

But the data of our research are for ordinary crime and it is to this problem that we return from that momentary digression. Having taken these steps, it should be possible to take money saved from a reduction in formal dispositions and expensive sanctioning to create opportunities through urban revitalization programs in the inner city and transitional areas. We are, in a sense, back where it was suggested that the start should be made, but at a different level. Most of the attempts to integrate youth into the larger society through work programs have failed They were obviously make-work programs. They did not produce a product which could be seen by youth as an achievement.

The creation of opportunities that are appealing to the disenchanted who also perceive themselves as the disinherited is not easy.* But if we can consider spending billions on intervention when we know that this approach does not produce a solution but only creates a greater problem, is it completely naive to suggest that we couldn't be worse off if more creative approaches were tried? Even if careful evaluation reveals that all programs for redevelopment are not entirely successful in incorporating youth into the larger society, the impact of a positive approach would not have the negative consequences that have been shown for traditional but increasingly punitive approaches.

FOOTNOTES

[1] The question, broadly defined, is one of social control. Diverse perspectives on this problem and the difficulty of assessing effectiveness is dealt with by Jack P. Gibbs, "Social Control, Deterrence, and Perspectives on Social Order," Social Forces, Vol. 56, December 1977, pp. 408-423. As has been indicated earlier, there is a vast and conflicting literature on this subject. Quite aside from the fact that some findings suggesting a relationship between perceived sureness of punishment and a deterrent effect are based on surveys in which respondents are asked, "if...would you," etc., there is no solid evidence that severe sanctions have a lasting deterrent effect on either specific types of offenses or crime in general. In addition to the research previously cited, the following articles are also suggested: Harold G. Grasmick and George J. Bryjak, "The Deterrent Effect of Perceived Severity of Punishment," Social Forces, Vol. 59, December 1980, pp. 471-491; Robert Nash Parker and M. Dwayne Smith, "Deterrence, Poverty, and Type of Homicide," American Journal of Sociology, Vol. 85, November 1979, pp. 614-624; David P. Phillips, "The Deterrent Effect of Capital Punishment: New Evidence on an Old Controversy," American Journal of Sociology, Vol. 86, July 1980, pp. 139-148; Charles R. Tittle, "Sanction Fear and the Maintenance of Social Order," Social Forces, Vol. 55, March 1977, pp. 579-596. An excellent summary of the research into the 1970s may be found in Charles R. Tittle and Charles H. Logan, "Sanctions and Deviance: Evidence

and Remaining Questions," Law and Society Review, Spring 1973, pp. 372-392.

This is only a small part of the research that has been reported in the journals during the past few years. Our point is that the evidence has failed to support the position that sanctions or more severe sanctions reduce crime and delinquency. Those who advocate increasing either the severity of sanctions or the certainty of their application must have some consequence other than deterrence, general or specific, as their rationale.

[2] This is by no means a plea for additional public housing projects. However desirable they may be as alternatives to rat-infested tenement houses, they have not been the solution to delinquency and crime for their occupants have not been integrated into the larger society by rehousing them. See Leo A. Schuerman and Solomon Kobrin, "High Risk Delinquency Neighborhoods and Public Housing Projects." Presented at the 1981 Annual Meeting of the Society for the Study of Social Problems, Toronto, August 22, 1981.

[3] The complexity of problems in our greatest metropolitan areas, problems which may be seen in miniature in smaller metropolitan areas such as Racine, has been presented in great detail in the testimony and papers included in Congressman Ronald V. Dellums' published hearings, Problems in Urban Centers, Oversight Hearings before the Committee on the District of Columbia, House of Representatives, Ninety-Sixth Contress, Second Session on Problems in Urban Centers, Washington, D.C., and the

Federal Government Role June 25-27, July 23, 25, and 30, September 30, 1980, Serial No. 96-17. While some emphasis was placed on the problems of Washington, D.C., the testimony and materials presented were drawn from metropolitan areas throughout the United States. First of all, there was not even agreement on the basic problems of urban areas. It should not be surprising then that there was no agreement on the effectiveness of attempts to ameliorate urban problems. This indicates the difficulty that will be encountered by those who wish to build on past successes and failures in future attempts to provide solutions to urban problems (whatever they be), whether it be the entire gamut of problems of delinquency and crime. Be all that as it may, these hearings and the papers and reports included as part of the testimony make it clear that there are no simple answers to the problems of urban centers.

* Acceptance of the failure of many programs designed to alleviate the problems of the less fortunate in our society leads to, among other things, emphasis on the neighborhood as a unit for planning changes. This is not the place to cite the relevant literature on the failure of past approaches or that literature, which if it had been considered, might have facilitated better designs and greater success for some programs. As a starting point for those who wish to consider the neighborhood, we do suggest Rolf Goetze, Understanding Neighborhood Change: The Role of Expectations in Urban Revitalization, Cambridge: Ballinger Publishing Co., 1979.

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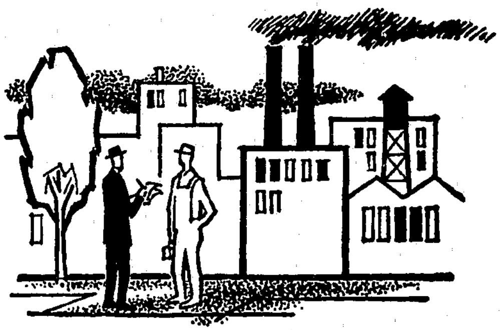

A History of
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APPENDIX A

SCALING BLOCK DATA ON HOUSING WITH GEOMETRIC AND FACTOR ANALYTIC TECHNIQUES

We have utilized block data from the 1950, 1960, and 1970 U.S. Censuses in two different approaches to the development of scales which represent the characteristics of residential areas in Racine. Both were employed in earlier research on the ecology of Racine but have been developed more fully in this research, a variety of sets of scale scores having been developed from different sets of (whole) unaggregated blocks as well as from sets of blocks, some of which were aggregated into equal spaces. In all cases the following variables (available for 1950, 1960, and 1970 and considered to be indicators of different facets of housing) were utilized: value of owner occupied housing, average contract rent, proportion of renter occupied units, proportion of overcrowding in block, and proportion of units lacking some or all plumbing.

Geometric Scaling

We initially thought that standard Guttman scaling would be the appropriate technique but preliminary scaling revealed that block data did not scale. Since each error type of a Guttman scale was descriptive of a set of housing conditions that existed and anything other than a set of scale scores representing each combination of housing characteristics would make less than maximum use of the data, we turned to Geometric scaling as one solution to the problem. Each geometric score represents a unique combination of housing characteristics and has certain advantages over additive scaling techniques that produce scores representative of combinations of attributes of varying amounts but which do not reveal which specific characteristics are present in relation to a given score. At the same time, geometric scores have the disadvantage of not being metric and at best can be dealt with as ordinal scales.

The correlation of each of the five housing variables with all other variables determined the weight that each variable would have in generating each unique geometric score. The three correlation matrices which provided a basis for this operation were derived from those aggregated equal spaces which were present 1950 through 1970 in order that any variation from year to year in the matrices would be based on differences in relationships between the variables alone rather than on differences which could at least in part be attributed to the addition of peripheral blocks or changes in the number of blocks within existing areas. When the housing variables were ordered from that with the highest (mean) set of correlations to the lowest there were some differences from year to year, as may be seen in Table 1. The mean for all three years determines which variables are given the highest weight on the geometric scoring system and which the lowest (an objective basis for assigning weights which increase in geometric ratio 1, 2, 4, 8, 16) so that a given scale score represents the same kind of block each year. Average value of owner occupied homes

TABLE 1. INTERRELATIONSHIP OF FIVE HOUSING VARIABLES FOR EQUAL SPACES, 1950, 1960, AND 1970

	1950				1960				1970			
	Lack Plbg.	Percent Renter	Percent Overcr.	Value Owner Occup.	Lack Plbg.	Percent Renter	Percent Overcr.	Value Owner Occup.	Lack Plbg.	Percent Renter	Percent Overcr.	Value Owner Occup.
Percent Lacking All Plumbing	-				-				-			
Percent Units Renter Occup.	.4373	-			.5900	-			.4583	-		
Percent Units Overcrowded	.4455	.1903	-		.2656	.1137	-		.0306	.1440	-	
Average Value Owner Occup.	-.3469	-.2700	-.1429	-	-.3362	-.4414	-.2551	-	-.2418	-.4757	-.3057	-
Average Contract Rent	-.3555	-.1044	-.1614	.5717	-.4201	-.3411	-.1331	.5801	-.3262	-.4002	-.2137	.7693

had the highest mean intercorrelation with other housing variables and percent overcrowded had the lowest.

Although the variables were intercorrelated in much the same way each year and could be ordered for a geometric scale as just described, the same cutting points could not be utilized each year. Inflation and a decrease in the proportion of units in the community lacking plumbing made it necessary to modify the cutting points each year in order to arrive at essentially the same proportion of the community's blocks in each of the undesirable categories for each variable. The cutting points for each variable were therefore selected so that essentially the same percent of the total whole blocks for each year would be above and below the cutting point for a given variable. Furthermore, the percent of the blocks that would receive 16 points (low value for owner occupied homes) was lowest and the percent of the blocks that would receive 1 point (overcrowding) was highest. A range of cutting points, such as that shown in Table 2, maximizes the scores for blocks with the least frequently appearing "undesirable" characteristics (low owner occupied housing value), other undesirable characteristics being correlated with it. The number of blocks for each variable which would receive points generating a score indicative of poorer housing are also shown for each year in Table 2.

As the geometric scoring system was established, a block with any overcrowding in 1950 (or circa 9% of the dwelling

TABLE 2. DISTRIBUTION OF BLOCKS IN RACINE 1950, 1960, AND 1970 ACCORDING TO NUMBER IN CATEGORIES THAT GENERATED POINTS FOR GEOMETRIC SCALE OF HOUSING TYPES

	1950			1960			1970		
	Cutting Points	Number of Blocks	Percent of Total Blocks	Cutting Points	Number of Blocks	Percent of Total Blocks	Cutting Points	Number of Blocks	Percent of Total Blocks
Average Value Owner Occupied	-7251	175	21.42	-10,101	224	21.90	-12,451	245	21.00
Average Contract Rent	-37	210	28.26	-64	221	25.94	-84	262	26.52
Percent Lacking All Plumbing	17.6+	245	29.38	5.9+	306	29.42	Any	345	29.31
Percent Units Renter Occup.	43.7+	290	34.81	38.5+	364	34.97	38+	410	34.83
Percent Units Overcrowded	Yes	203	24.37	9.3+	399	38.33	9+	456	38.74

units in the block overcrowded in 1960 or 1970) received one point, a block with a relatively high percentage of renters two points, a block with a given percentage of dwelling units lacking some or all plumbing (any lacking in 1970) four points, a block with relatively low average rent eight points, and a block with relatively low average value of owner occupied housing 16 points. Thus, the poorest type of residential block would have 31 points, while the very best type of block would have a score of zero, each score representing a different combination of the five basic variables. The net result was a set of scores which sharply differentiated inner city and interstitial areas from more stable and peripheral residential areas.

The distribution of blocks in 1950, 1960, and 1970 according to their geometric scale scores is shown in Table 3. Although we have indicated that the block data do not produce a Guttman scale, not only were those blocks with low property value also very likely to have other undesirable characteristics, but those with low rent were, in turn, likely to have the other undesirable characteristics below them on the scale, and so on. In 1950, 53.5% of the blocks fell into scores 0, 1, 3, 7, 15, and 31, scores that would have been perfect Guttman types. In 1960 this figure was 61.7% and in 1970 it was 57.6%. Still, the proportion of error types was very high.

TABLE 3. CHARACTERISTICS OF INDIVIDUAL GEOMETRIC SCORES

Geometric Scale							Total Number and Percent of Blocks					
							1950		1960		1970	
Map Symbol	Score	Overcrowding	Renters	Lack Plumbing	Low Rent	Low Property Value	N	%	N	%	N	%
A	0						315	37.82	349	33.79	326	30.16
B	1	X					46	5.52	176	17.04	186	17.21
C	2		X				71	8.52	73	7.07	78	7.22
D	3	X	X				23	2.76	23	2.23	28	2.59
E	4			X			22	2.64	32	3.10	54	5.00
F	5	X		X			5	.60	13	1.26	28	2.59
G	6		X	X			23	2.76	37	3.58	44	4.07
H	7	X	X	X			25	3.00	26	2.52	16	1.48
I	8				X		50	6.00	16	1.55	23	2.13
J	9	X			X		8	.96	3	.29	4	.37
K	10		X		X		12	1.44	6	.58	11	1.02
L	11	X	X		X		6	.72	5	.48	7	.65
M	12			X	X		11	1.32	7	.68	9	.83
N	13	X		X	X		5	.60	1	.10	3	.28
O	14		X	X	X		24	2.88	23	2.23	22	2.04
P	15	X	X	X	X		12	1.44	20	1.94	6	.56
Q	16					X	28	3.36	9	.87	6	.56
R	17	X				X	2	.24	16	1.55	17	1.57
S	18		X			X	3	.36	10	.97	11	1.02
T	19	X	X			X	4	.48	11	1.06	7	.65
U	20			X		X	14	1.68	4	.39	4	.37
V	21	X		X		X	8	.96	11	1.06	2	.19
W	22		X	X		X	15	1.80	8	.77	13	1.20
X	23	X	X	X		X	19	2.28	22	2.13	18	1.67
Y	24				X	X	5	.60	12	1.16	5	.46
Z	25	X			X	X	4	.48	6	.58	4	.37
▨	26		X		X	X	8	.96	13	1.26	17	1.57
°	27	X	X		X	X	3	.36	6	.58	25	2.31
¢	28			X	X	X	12	1.44	7	.68	8	.74
•	29	X		X	X	X	8	.96	15	1.45	8	.74
◘	30		X	X	X	X	17	2.04	30	2.90	31	2.87
*	31	X	X	X	X	X	25	3.00	43	4.16	60	5.55
						TOTAL	833	99.98	1033	100.01	1081	100.04

Two other matters must be mentioned before leaving the discussion of geometric scales. There was, of course, a problem of missing data for some variables for some blocks and even all data for other blocks. Missing block data were of two types: 1) no data in a category for a given block of suppressed data for an item because there were fewer than five dwelling units in the category or 2) suppressed data for the entire block for those blocks having fewer than five dwelling units. It was necessary to estimate an average rent for blocks which had rental property (including those with missing data for average rent and average property value). Other blocks had no average value of owner occupied units and it was necessary to estimate average property values for these from their average rents. Estimated average rents were based on the average rent of dwelling units in blocks with similar average owner occupied property values, and vice versa. Blocks with both missing were given values based on the average of all residential blocks contiguous to them. It should be noted that blocks with suppressed average rent were in large part high average value of owner occupied dwelling units and blocks with suppressed average value of owner occupied dwelling units were high rent blocks so that rental estimates and property value estimates were high and therefore gave neither low average rents nor low average property values. _In other words, estimates from missing values did not generate many lower scoring blocks_. These blocks with all data suppressed were excluded from the geometric scaling. Most blocks consisted of residential units with all plumbing facilities; we have assumed that those blocks with suppressed data on plumbing have so few units lacking all plumbing facilities that they have little effect on the total picture of housing in Racine and that we were justified in treating all of them as blocks with all plumbing. Blocks without data on the number of overcrowded units were treated as blocks without overcrowding.

Geometric scores may be treated as having either nominal or ordinal properties, depending on how one looks at them. They may be considered nominal in the sense that each score represents only one combination of characteristics and is in itself a description of the characteristics of a block. Several anomalies do exist, however, and this makes it difficult to accept geometric scores as perfect rank orderings for statistical analysis, 0 being the highest and 31 the lowest. For example, the score of 16 (based on low property value) may not represent poorer housing than score 15 (which has every undesirable characteristic except low property value). However, since there were only 28 blocks with a score of 16 in 1950, nine in 1960, and six in 1970, this (the most questionable juxtaposition of scores and housing characteristics) does not upset us too much.

Factor Scaling

Two types of factor scores were computed for two types of "blocks." The first type of factor score is the "raw" factor score based on the five housing variables which are described below. These factor scores have an approximate mean of zero and variance of 1.0. The second type of factor score was computed by rescaling the raw factor scores so that they range from 0 to 100.

The two types of blocks are "whole" blocks for each census year and "equal spaces" which permit comparisons between censuses. The whole blocks are individual blocks which were used for geometric scaling. The equal spaces also include aggregated spaces which represent splitting or combining of blocks across census years.

Prior to doing the factor analysis, we estimated average contract rent for blocks which contained no renters (i.e., where the occupied units were 100% owner occupied) and average dollar value of houses for blocks which contained no owner occupied units (i.e., the occupied units were 100% renter occupied). This was done to minimize the loss of blocks which otherwise have complete data when computing the composite factor scores. After a number of unsuccessful attempts to estimate these values using all five housing variables, we decided to use only the relevant dollar value. That is, average dollar value of housing was used to estimate average contract rent and vice versa. The estimation equations were obtained by regressing these variables on each other for the appropriate types of blocks. The estimation equations and other relevant data are presented in Table 4. These data show

TABLE 4. REGRESSION EQUATIONS AND UNIVARIATE STATISTICS FOR ESTIMATION OF AVERAGE DOLLAR VALUE FOR HOUSING AND AVERAGE CONTRACT RENT

		1950 Whole Blocks (1950 Series = 0 or 2)		1960 Whole Blocks (1960 Series = 0 or 2)	
Estimation Equations:		RENT = 29.0882 + .0013 X VALUE		RENT + 46.5749 + .0017 X VALUE	
		VALUE = -1018.1985 + 260.3852 X RENT		VALUE = -1451.5009 + 215.7496 X RENT	
Before Estimation:		Rent	Value	Rent	Value
	X	41.312	9738.901	70.137	13680.596
	S.D.	8.792	4004.361	12.614	4464.310
	N	743	817	852	1023
After Estimation:					
	X	41.853	9732.324	71.269	13682.148
	S.D.	9.069	3995.055	12.236	4502.414
	N	833	833	1041	1034

		1970 Whole Blocks (1970 Series = 0 or 2)	
Estimation Equations:		RENT = 48.6162 + .0029 X VALUE	
		VALUE = -5554.9889 + 232.5251 X RENT	
Before Estimation:		Rent	Value
	X	99.256	17524.430
	S.D.	25.967	7366.174
	N	982	1161
After Estimation:			
	X	102.288	17487.277
	S.D.	27.190	7362.332
	N	1173	1177

TABLE 4. Continued

	1950 - 60 Equal Spaces (1960 Series = 0 or 3 and 1950 Series $\neq$ 9)	1960 - 70 Equal Spaces (1970 Series = 0 or 3 and 1960 Series $\neq$ 9)
Estimation Equations:	1950 RENT = 27.9841 + .0014 X VALUE VALUE = -3.1458 + 234.1528 X RENT	1960 RENT = 47.6338 + .0016 X VALUE VALUE = -2125.1383 + 224.5513 X RENT
	1960 RENT + 45.1758 + .0019 X VALUE VALUE = 113.0868 + 188.8570 X RENT	1970 RENT = 47.0170 + .0030 X VALUE VALUE = -3405.2216 + 203.4795 X RENT

	1950		1960		1960		1970	
Before Estimation:	Rent	Value	Rent	Value	Rent	Value	Rent	Value
X	41.403	9691.387	69.821	13299.189	70.086	13612.657	95.260	15978.214
S.D.	8.713	3582.973	12.679	4047.741	12.587	4644.339	20.478	5316.098
N	693	763	730	818	795	931	835	938
After Estimation:								
X	41.815	9681.152	70.830	13300.199	71.022	13617.934	96.900	15938.527
S.D.	8.758	3578.075	12.626	4090.606	12.397	4689.320	20.645	5299.008
N	775	775	831	826	946	941	952	952

TABLE 4. Continued

1950 - 70 Equal Spaces
(1950 Series = 0 or 2)

Estimation Equations:

1950

RENT = 29.0882 + .0013 X VALUE

VALUE = -1018.1985 + 260.3852 X RENT

1960

RENT = 47.3209 + .0017 X VALUE

VALUE = -618.5357 + 201.6747 X RENT

1970

RENT = 47.4613 + .0030 X VALUE

VALUE = -3112.4243 + 198.7278 X RENT

	1950		1960		1970	
Before Estimation:	Rent	Value	Rent	Value	Rent	Value
$\bar{X}$	41.312	9738.901	69.771	13452.561	93.554	15479.292
S.D.	8.792	4004.361	12.766	4437.932	20.391	5267.768
N	743	817	800	893	894	894
After Estimation:						
$\bar{X}$	41.853	9732.338	70.721	13439.737	94.802	15419.923
S.D.	9.069	3995.285	12.701	4477.494	20.646	5252.536
N	833	833	912	904	910	910

that the goal of the estimation procedure was satisfactorily achieved, that is, estimated values were obtained for the "missing" blocks with only minor changes in the summary statistics.

The summary statistics (means and standard deviations) for the 1950 average dollar values are slightly different for the 1950 whole blocks and the 1950-1970 equal spaces as a result of using a greater number of decimal places in earlier computations but this has virtually no effect on the factor scores.

To obtain a weighted composite measure which summarizes housing characteristics, a principal components analysis of the five housing variables for each type of block was done. The principal components method does not require any assumptions about an underlying factor structure and yields a summary description of the data. The SPSS PAI method was used with a restriction to a one-factor solution (no rotation required). The results of the factor analyses are presented in Table 5.

As a compliment to the raw factor scores, we computed an "adjusted" factor score with a range of 0 to 100. The equation used to compute the adjusted factor scores is:

$$y = (x - a)\,\frac{\beta - \sigma}{b - a} + \alpha$$

where y = adjusted factor score,

x = raw factor score,

a = minimum raw factor score,

b = maximum raw factor score,

α = minimum adjusted factor score (i.e., 0), and

β = maximum adjusted factor score (i.e., 100).

The relevant data and summary statistics for the final factor scores are presented in Table 6.

The Spatial Distribution of Geometric and Factor Scores

Mean factor scores and mean geometric scores by census tracts, police grid areas, and natural areas are shown in Tables 7, 8, and 9, as are the averages for each of the variables which were used in developing the housing scores. Tracts, grid areas, and natural areas are arranged in the relatively homogeneous groupings based on analysis of the non-metric data and described in an earlier report on the research.

Perusal of both factor and geometric scores indicates that the inner city census tracts were justifiably separated from others but from there on the homogeneity of these groupings declines and there are differences in the rankings of census tracts from year to year. It is also quite evident that Tracts 11 and 14 are at the opposite extreme and now almost identical in housing characteristics.

There were relatively few changes between 1950 and 1970 in the housing score rankings of police grid areas, particularly if one of those areas with scores for 1950, 1960, and 1970 were considered. Although the inner city grid areas were again consistently far lower in housing quality than other areas and the two grids considered partially in transition were consistently below them in housing scores, the three remaining

TABLE 5. RESULTS OF PRINCIPAL COMPONENTS ANALYSIS OF RACINE CENSUS BLOCK HOUSING VARIABLES

	1950 Whole Blocks		1960 Whole Blocks		1970 Whole Blocks	
Variables	Factor Loadings	Factor Score Coefficients	Factor Loadings	Factor Score Coefficients	Factor Loadings	Factor Score Coefficients
% Lacking Plumbing	- .773	- .33614	- .745	- .30087	- .517	- .22070
% Renter-occupied	- .578	- .25112	- .710	- .28656	- .662	- .28232
% Overcrowded	- .519	- .22539	- .381	- .15393	- .284	- .12105
Average Value	.753	.32727	.808	.32644	.889	.37937
Average Rent	.730	.31727	.787	.31767	.876	.37352
Eigenvalue	2.301		2.476		2.345	

	1950-60 Equal Spaces				1960-70 Equal Spaces			
	Factor Loadings		Factor Score Coefficients		Factor Loadings		Factor Score Coefficients	
	1950	1960	1950	1960	1960	1970	1960	1970
% Lacking Plumbing	-.790	-.744	-.34589	-.29756	-.732	-.555	-.30142	-.22891
% Renter-occupied	-.552	-.736	-.24204	-.29417	-.701	-.696	-.28840	-.28703
% Overcrowded	-.508	-.381	-.22238	-.15216	-.357	-.343	-.14697	-.14150
Average Value	.754	.800	.33017	.31996	.802	.875	.33034	.36091
Average Rent	.727	.788	.31844	.31495	.794	.866	.32698	.35722
Eigenvalue	2.283	2.501			2.429	2.423		

TABLE 5. Continued

	1950 - 70 Equal Spaces					
	Factor Loadings			Factor Score Coefficients		
	1950	1960	1970	1950	1960	1970
% Lacking Plumbing	- .773	- .757	- .565	- .336	- .302	- .227
% Renter-occupied	- .578	- .742	- .732	- .251	- .296	- .295
% Overcrowded	- .519	- .394	- .384	- .225	- .157	- .154
Average Value	.753	.786	.865	.327	.313	.348
Average Rent	.730	.782	.857	.317	.312	.345
Eigenvalue	2.301	2.509	2.486			

TABLE 6. UNIVARIATE STATISTICS FOR RAW AND ADJUSTED FACTOR SCORES

	Whole Blocks					
	1950		1960		1970	
	Raw	Adjusted	Raw	Adjusted	Raw	Adjusted
X̄	-0.0	46.049	.017	48.546	-.001	46.067
S.D.	1.000	8.076	.977	15.053	.999	12.022
Minimum	-5.703	0	-3.135	0	-3.831	0
Maximum	6.681	100	3.358	100	4.482	100
N	833		1033		1173	

	1950 - 60 Equal Spaces			
	1950		1960	
X̄	-0.0	50.370	.017	46.211
S.D.	1.000	8.279	.978	15.038
Minimum	-6.085	0	-2.989	0
Maximum	5.995	100	3.516	100
N	775		824	

	1960 - 70 Equal Spaces			
	1960		1970	
X̄	.016	35.098	0.0	44.008
S.D.	.978	10.956	1.000	11.316
Minimum	-3.118	0	-3.889	0
Maximum	5.811	100	4.948	100
N	939		952	

	1950 - 70 Equal Spaces					
	1950		1960		1970	
X̄	-0.0	46.044	.022	46.592	-0.0	41.355
S.D.	1.000	8.076	.975	15.431	1.000	11.867
Minimum	-5.702	0	-2.922	0	-3.485	0
Maximum	6.681	100	3.396	100	4.942	100
N	833		902		910	

TABLE 7. BLOCK HOUSING CHARACTERISTICS FOR CENSUS TRACTS: 1950-1970

	Average $ Value Owner Occupied Units			Average $ Rent Renter Occupied Units			Average % Lacking Plumbing			Average % Units Renter Occupied			Average % Units Overcrowded			Mean Factor Score			Mean Geometric Score		
	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970
Inner City and Interstitial Areas:																					
1	9,182	10,143	11,440	38.6	58.1	71.3	34.21	47.38	20.21	86.0	93.8	94.3	3.02	2.11	7.71	37.02	22.86	22.31	8.69	15.79	19.43
3	7,002	10,148	11,547	36.8	62.0	81.0	25.78	20.96	6.22	51.5	56.7	56.0	3.19	14.95	12.86	38.45	30.64	33.55	18.70	20.30	20.89
4	6,979	9,597	10,914	36.5	62.0	78.8	25.73	18.37	7.24	54.7	54.5	55.9	3.36	13.01	12.29	39.04	31.69	32.50	17.22	21.72	24.37
5	7,625	10,142	11,360	40.4	64.3	82.4	22.52	18.87	6.01	46.7	51.8	55.7	2.49	14.56	13.67	41.55	32.69	33.60	13.32	16.63	20.96
Heterogeneous Transitional Areas:																					
2	12,035	13,747	16,216	49.1	71.4	94.4	12.71	10.49	6.11	51.6	53.8	58.4	1.14	4.12	5.72	49.32	45.30	39.59	4.35	8.76	10.07
6	9,930	12,679	15,147	40.6	71.5	95.6	6.33	2.34	1.11	24.7	24.6	27.8	1.13	5.80	5.13	48.14	49.82	44.84	3.10	3.60	2.58
Older Stable Residential Areas:																					
7	10,144	13,756	15,790	47.8	73.6	94.9	5.09	1.31	.33	22.3	18.4	20.5	1.23	6.80	5.58	49.29	53.57	46.37	2.89	1.37	2.33
13	10,153	13,818	15,620	39.9	70.8	95.0	9.74	3.36	1.65	28.4	27.2	29.9	.93	4.58	4.79	47.45	51.31	44.74	4.62	5.80	8.56
Southwestern Fringe Areas:																					
8	11,050*	16,115	18,561	45.0	78.0	105.4	.00	.00	.96	9.9	1.8	6.2	.00	17.04	15.09	--	57.87	49.74	--	.92	2.48
9	8,171	13,397	18,437	35.8	71.6	110.6	8.22	3.58	.61	11.8	13.4	20.7	1.25	15.70	9.59	46.81	50.56	49.87	9.15	5.37	2.20
10	10,855	13,237	16,597	45.6	73.8	101.3	3.14	1.88	1.00	29.5	23.8	24.7	.43	9.30	9.09	50.43	51.28	46.59	1.32	5.05	3.73
Northwestern Fringe Areas:																					
11	12,717	18,300	22,899	48.4	76.8	119.1	1.66	1.14	.65	15.1	8.7	11.5	.13	4.88	4.48	54.17	63.52	56.05	.50	.63	1.17
12	9,240	14,565	17,776	36.9	72.1	103.2	11.48	1.27	1.25	35.2	19.6	23.5	3.26	8.72	8.09	44.18	53.77	47.98	5.61	2.21	3.86
14	12,887	18,572	23,301	46.7	79.1	125.4	11.56	1.29	.54	14.7	10.1	13.7	1.77	9.30	7.58	51.31	63.60	56.06	6.06	1.49	1.06

* Fewer than 5 blocks in Census Tract within city limits.

TABLE 8. BLOCK HOUSING CHARACTERISTICS FOR POLICE GRID AREAS: 1950-1970

	Average $ Value Owner Occupied Units			Average $ Rent Renter Occupied Units			Average % Lacking Plumbing			Average % Units Renter Occupied			Average % Units Overcrowded			Mean Factor Score			Mean Geometric Score		
	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970
Inner City & Interstitial:																					
8	7,732	10,469	11,974	37.0	62.9	82.9	17.76	8.98	3.11	44.5	43.5	44.8	1.43	7.99	8.91	42.02	38.83	37.33	12.63	16.46	19.79
12	10,066	11,476	13,125	41.6	63.7	83.6	28.90	27.42	13.34	69.0	73.2	75.8	3.08	8.69	7.22	40.40	30.02	30.67	12.14	16.45	16.79
13	7,969	10,705	12,531	39.0	65.9	85.1	16.96	12.76	3.95	38.7	41.9	42.8	2.32	13.36	10.47	43.06	38.35	37.74	11.25	13.52	15.15
16	9,237	12,374	14,419	43.7	67.9	89.4	15.23	11.53	3.20	44.5	47.3	48.6	2.18	9.34	9.33	45.05	41.46	39.36	10.23	13.32	14.09
Partially in Transition:																					
9	8,612	12,968	15,127	36.2	68.0	91.9	14.50	6.46	3.41	38.0	30.0	32.9	1.51	9.84	9.81	43.52	46.97	42.37	9.67	6.72	10.66
17	9,141	12,116	13,921	42.4	69.4	91.2	12.28	10.23	3.76	35.5	38.9	43.9	1.27	7.29	8.12	46.19	44.17	39.91	6.38	6.96	8.93
Stable Residential:																					
4	14,318	19,676	22,364	47.2	80.2	116.9	6.35	.37	.39	15.5	9.4	11.8	.89	4.81	3.98	54.11	65.99	55.47	2.16	.51	1.29
14	12,982	17,548	21,097	48.1	76.5	108.5	1.90	1.25	.88	16.7	12.4	15.0	.16	4.47	3.36	54.14	61.50	53.23	.52	.94	1.59
18	9,657	12,212	15,147	43.3	72.1	97.3	4.51	2.99	1.16	27.3	22.8	25.0	.48	12.32	10.06	48.80	48.41	44.65	3.74	6.57	4.35
21	10,836	14,650	16,979	45.9	74.7	97.8	4.85	.44	.34	17.4	9.7	10.0	1.57	9.15	7.38	50.65	55.99	48.64	1.00	.56	1.40
Peripheral High Target or Recently Developing Areas:																					
5	8,891	13,799	16,320	39.8	74.2	103.0	13.02	1.93	.82	24.2	16.7	25.6	3.65	8.24	8.28	45.30	53.63	46.68	4.83	2.38	1.91
6	--	16,250*	22,120*	--	77.5	120.0	--	2.48	.00	--	13.8	10.2	--	12.03	8.40	--	56.93	54.38	--	2.25	.40
15	--	20,286	24,169	--	79.7	133.1	--	.00	.00	--	4.1	12.1	--	4.71	9.31	--	67.28	57.91	--	.14	.75
22	9,387	14,689	18,927	38.5	74.5	105.4	6.09	1.64	.35	12.1	12.9	14.1	1.58	13.59	9.46	48.30	54.35	50.34	4.50	2.77	1.07
20	20,884*	30,000*	15,750*	57.0	84.0	87.5	4.17	.00	1.00	17.7	18.2	31.0	.00	.00	25.50	--	--	40.35	--	--	8.00
Suburban Residential:																					
1	7,546*	22,438	28,041	29.0	91.7	151.2	5.90	1.17	.30	23.9	11.6	17.4	.00	8.90	5.06	--	68.61	61.44	--	.88	1.21
2	10,678*	18,275	20,447	24.0	90.2	130.3	18.90	1.89	.80	18.9	27.0	30.1	10.80	11.97	12.60	--	60.46	51.93	--	2.40	2.20
10	11,283*	20,375	29,192	34.5	88.0	149.8	5.85	.00	.08	53.9	12.6	10.8	19.55	3.58	5.33	--	67.59	63.77	--	.50	.67
19	--	--	22,667	--	--	141.9	--	--	.33	--	--	21.2	--	--	12.22	--	--	56.29	--	--	1.56
23	--	--	27,886	--	--	186.7	--	--	.13	--	--	59.8	--	--	4.63	--	--	63.83	--	--	1.75

* Fewer than 5 blocks in Grid Area within city limits.

TABLE 9. BLOCK HOUSING CHARACTERISTICS FOR NATURAL AREAS: 1950-1970

	Mean $ Value Owner Occupied Units			Mean $ Rent, Renter Occupied Units			Mean % Lacking Plumbing			Mean % Units Renter Occupied			Mean % Units Overcrowded			Mean Factor Scores			Mean Geometric Score		
	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970
Inner City:																					
1	6,873	9,525	10,791	36.8	62.9	79.1	29.49	20.67	8.02	57.1	57.6	59.8	3.66	15.40	13.55	37.78	30.33	31.46	18.77	20.62	24.95
2	6,820	9,761	10,736	38.0	60.6	78.6	31.11	32.92	9.59	55.6	61.5	64.6	4.19	18.36	12.97	37.76	24.82	30.19	18.71	21.44	22.63
Interstitial Areas:																					
3	8,434	11,500	12,525	40.6	65.7	84.3	18.28	12.20	6.39	49.0	54.2	57.2	1.74	7.76	11.50	42.86	38.16	34.65	8.14	11.62	17.11
4	8,018	10,464	12,469	36.9	62.2	84.5	15.24	6.88	2.78	42.7	42.6	41.0	.91	6.16	6.87	42.92	39.70	38.81	10.81	15.45	16.68
5	11,487	12,081	14,599	46.4	68.0	88.6	16.11	15.73	7.42	59.0	65.2	66.9	1.29	4.95	6.85	46.28	37.80	36.00	7.03	13.82	14.26
6	9,285	12,408	14,450	40.5	66.6	88.1	9.93	4.50	2.24	42.1	40.0	46.5	1.12	5.83	9.67	45.61	44.92	39.85	4.30	7.74	9.24
7	--	--	17,300*	--	--	111.3	--	--	.00	--	--	8.3	--	--	17.25	--	--	49.15	--	--	1.00
8	8,944	10,924	14,483	38.3	68.0	95.5	2.47	4.47	1.08	39.2	24.1	28.1	.57	18.94	14.67	46.01	43.19	42.87	5.91	12.24	6.07
Stable Residential:																					
9	9,239	13,468	16,368	38.3	69.3	91.6	9.83	2.88	2.52	37.3	31.6	32.5	2.05	7.41	5.79	45.10	49.10	44.38	5.17	4.32	7.42
10	9,461	12,458	14,598	41.8	71.5	94.6	5.15	3.27	.89	28.4	29.6	35.2	.93	5.50	6.06	48.08	49.20	43.42	3.80	3.16	3.94
11	10,180	13,143	15,350	43.9	72.0	95.0	6.04	3.01	2.32	33.9	35.5	38.6	.93	4.96	4.03	48.51	49.31	43.23	1.46	3.25	3.65
12	9,307	15,287	18,024	33.3	74.2	108.9	15.49	.42	.62	32.6	13.3	19.6	5.01	9.60	9.69	43.10	56.12	49.15	6.04	1.04	2.00
13	10,367	14,204	16,483	41.3	74.9	97.5	6.85	2.19	.97	20.4	18.8	21.1	1.53	5.22	4.98	48.72	54.80	47.00	2.44	2.17	2.03
14	9,501	12,614	16,233	39.7	69.4	97.6	6.56	1.91	.42	18.2	17.8	18.3	1.58	6.90	5.33	47.88	50.45	47.32	4.38	3.20	1.89
Peripheral Middle Class Residential:																					
15	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
16	10,448	13,445	16,198	47.0	76.3	102.5	4.23	1.20	.89	23.0	20.4	18.8	.17	6.97	6.98	50.72	53.73	47.40	1.31	1.72	1.76
17	11,013	14,887	17,176	46.1	75.4	97.4	4.88	.41	.40	16.2	7.9	7.9	1.75	9.84	7.25	50.81	56.50	48.98	1.09	.55	1.34
18	7,464	18,024	22,589	39.8	81.7	127.3	23.26	1.00	.52	13.4	13.0	16.2	3.28	11.77	8.03	43.33	61.09	55.34	10.86	1.15	1.21
19	8,542	14,702	18,423	36.8	74.6	101.1	8.07	1.98	.32	12.8	11.8	12.6	1.21	12.07	8.45	47.31	54.83	49.86	7.54	1.76	1.32
20	13,638	18,775	22,648	50.2	80.1	116.9	1.19	.43	.61	13.1	7.9	10.2	.11	4.12	4.23	55.49	65.06	55.86	.09	.29	1.19
Upper Class Residential:																					
21	15,662	19,733	20,800	60.9	84.3	110.9	2.94	.56	.53	31.4	33.3	25.7	.50	1.59	7.20	57.91	63.61	51.08	.76	.93	1.60
22	--	--	22,667	--	--	141.9	--	--	.33	--	--	21.2	--	--	12.22	--	--	56.29	--	--	1.56
23	--	--	28,513	--	--	148.7	--	--	.00	--	--	15.8	--	--	4.13	--	--	63.28	--	--	.75
24	--	--	27,886	--	--	186.7	--	--	.13	--	--	59.8	--	--	4.63	--	--	63.82	--	--	1.75
25	18,218	23,186	27,530	52.4	86.5	138.7	1.73	.12	.00	15.6	6.0	10.3	.21	2.59	3.00	59.39	73.17	62.48	.73	.23	.60
26	--	--	24,400*	--	--	160.0	--	--	.00	--	--	49.0	--	--	1.00	--	--	59.70	--	--	1.00

* Fewer than 5 blocks within City Limits.

groups were not as homogeneous as expected. Grid areas included in the group characterized as suburban residential were at or near the opposite end of the housing continuum from the poor housing in the inner city.

We have previously commented on the fact that the natural areas which we have been utilizing were constructed for research purposes and that an effort had been made to insure that they were relatively homogeneous. It is no surprise that by 1970 the factor and geometric scores rank, with few exceptions, consistently from group to group. The scores for Natural Area 7 must be disregarded since most of that area was not in the City of Racine. Were all blocks in that area considered, it would be similar to other interstitial areas. Perusal of the scores reveals that inner city and interstitial change has been captured by these scoring systems. We shall expect the type of change phenomena in which we are interested to be best described by analyses based on natural areas--and smaller homogeneous neighborhoods.

For the reader who might be concerned about comparisons based on the means of geometric scores or the means of transformed factor scores (which are not really comparable from 1950 to 1960 to 1970), it should be added that we have also constructed tables using raw factor scores which lead to the same conclusion, that is the relative distinctiveness of housing in the inner city and interstitial areas and the systematic change that has been taking place in these areas between 1950 and 1970.

Parallel to this, the raw factor scores reveal that other areas have retained their better characteristics.

APPENDIX B

POPULATION CHARACTERISTICS OF CENSUS TRACTS, POLICE GRID AREAS, NATURAL AREAS, AND NEIGHBORHOODS

Tables 1 through 4 of this appendix show the population, number of blocks, and number of occupied dwelling units in each area for each spatial system. The percent of the total population, blocks, and occupied dwelling units in Racine in each area for each year 1950 through 1980 are shown with the exception of occupied dwelling units for 1980. Although the areas in each spatial system were organized in groups that seemed appropriate in terms of our perception of census tracts, police grid areas, and natural areas at that time, other arrangements were also made so that the final organization of areas in the text of the report is not entirely consistent with various presentations shown in this appendix. Neighborhoods are not arranged according to groupings in this appendix, however.

Tables 5 through 8 contain additional data on the characteristics of groupings of census tracts, police grid areas, and natural areas. Although we do not consider race/ethnicity to be an explanatory variable, a word should be said about the distribution of the non-White or Black population in Racine. It is apparent, as in other urban-industrial cities, that the Black population is concentrated in the inner city and interstitial areas. Although Blacks are found more and more throughout the city, the proportion of those in the inner city and interstitial areas who are Black has also been increasing. Desegregation has been taking place but with the movement of the Black population

TABLE 1. POPULATION, NUMBER OF BLOCKS, AND NUMBER OF OCCUPIED DWELLING UNITS IN 1970 RACINE CENSUS TRACTS: 1950 - 1980

Census Tract Number	POPULATION								BLOCKS								OCCUPIED DWELLING UNITS							
	1950		1960		1970		1980		1950		1960		1970		1980		1950		1960		1970		1980	
	N[1]	%	N[2]	%	N[3]	%	N[4]	%	N[5]	%	N	%	N	%	N[6]	%	N[7]	%	N	%	N	%	N	%
Inner City and Interstitial Areas																								
1	811	1.1	723	0.8	309	0.3	278	0.3	35	3.3	23	1.9	23	2.3	23	2.3	241	1.1	395	1.5	212	0.7	--	--
2	9062	12.7	7801	8.7	7085	7.4	5821	6.8	85	8.1	80	6.6	80	6.6	80	6.6	2686	12.7	2660	9.8	2590	8.4	--	--
3	6862	9.6	6461	7.2	4964	5.2	4004	4.7	98	9.3	88	7.3	80	6.6	80	6.6	2034	9.6	1958	7.2	1428	4.6	--	--
4	7923	11.1	7404	8.3	6222	6.5	5073	5.9	105	10.0	95	7.9	85	7.0	85	7.0	2349	11.1	2276	8.3	1873	6.1	--	--
5	8322	11.7	8841	9.9	7443	7.8	6812	8.0	93	8.8	96	8.0	89	7.3	89	7.3	2466	11.7	2477	9.1	2219	7.2	--	--
	32980	46.2	31230	34.9	26023	27.2	21988	25.7	416	39.5	382	31.7	362	29.8	362	29.8	9776	46.2	9766	35.9	8322	27.0		
Older Stable Residential Areas																								
6	6457	9.1	6515	7.3	6299	6.6	5363	6.3	75	7.1	72	6.0	75	6.2	75	6.2	1913	9.1	2039	7.5	2069	6.7	--	--
7	5581	7.8	7813	8.7	7278	7.6	6095	7.1	99	9.4	98	8.1	102	8.4	102	8.4	1654	7.8	2367	8.7	2416	7.8	--	--
13	10636	14.9	10579	11.8	9908	10.4	8283	9.7	129	12.2	128	10.6	128	10.5	128	10.5	3153	14.9	3415	12.5	3404	11.0	--	--
	22674	31.8	24907	27.8	23485	24.6	19741	23.1	303	28.7	298	24.7	305	25.1	305	25.1	6720	31.8	7821	28.7	7889	25.5		
Newer Stable Residential Areas																								
8	35	0.1	1547	1.7	2741	2.9	2768	3.2	17	1.6	17	1.4	25	2.1	25	2.1	10	0.1	361	1.3	697	2.2	--	--
12	4036	5.7	6958	7.8	8925	9.4	7550	8.8	77	7.3	114	9.5	99	8.2	99	8.2	1197	5.7	1944	7.1	2995	9.7	--	--
14	1915	2.7	7023	7.8	8897	9.3	7166	8.4	64	6.1	100	8.3	102	8.4	102	8.4	566	2.7	2153	7.9	2639	8.6	--	--
	5986	8.5	15528	17.3	20563	21.6	17484	20.4	158	15.0	231	19.2	226	18.7	226	18.7	1773	8.5	4458	16.3	6321	20.5	--	--
Growing Fringe Areas																								
9	1267	1.8	4629	5.2	7090	7.5	8227	9.6	41	3.9	87	7.2	92	7.6	92	7.6	375	1.8	1228	4.5	2329	7.6	--	--
10	5090	7.2	7809	8.7	9768	10.3	9990	11.7	89	8.4	133	11.0	142	11.7	142	11.7	1509	7.2	2367	8.7	3018	9.8	--	--
11	3196	4.5	5373	6.0	7415	7.8	7027	8.2	47	4.5	73	6.1	79	6.5	79	6.5	947	4.5	1631	6.0	2387	7.7	--	--
15	--	--	16	-.1	818	.9	1084	1.3	--	--	1	.1	8	0.7	68	.7	--	--	4	-.1	554	1.8	--	--
	9553	13.5	17827	19.9	25091	26.5	26328	30.8	177	16.8	294	24.4	321	26.5	321	26.5	2831	13.5	5230	19.2	8288	26.9		
TOTAL	71193	100.0	89492	99.9	95162	99.9	85541	100.0	1054	100.0	1205	100.0	1214	100.1	1214	100.1	21100	100.0	27275	100.1	30820	99.9		

FOOTNOTES - TABLE 1

[1] The 1950 U.S. Census of Housing (1950 Housing Census Report, Block Statistics, Vol. V, Part 154 H-E154) for Racine, Wisconsin, did not contain population counts for each block. Although we attempted to secure 1950 Block data from the Bureau of the Census, they were not available. Population estimates for each Census Tract in 1950 were obtained by multiplying the total population for Racine in 1950 by the percent of Racine's occupied dwelling units in that tract in 1950. This is considered the best possible population estimate for each Census Tract because the percent of the 1960 and 1970 population for each tract developed from block data has a larger correlation with the percent of the occupied dwelling units in each tract for each year, than with the percent of the bocks in each tract. All calculations were carried out to two decimal places but rounded for presentation in this table.

[2] U.S. Census of Housing: 1960. City Blocks, Series HC (3) - 418.

[3] U.S. Census of Housing: 1970. Blocks Statistics, Series HC (3) 272.

[4] Census of Population and Housing, 1980. P.L. 94-171 Counts.

[5] The number of blocks in each Census Tract is based on the 1950, 1960, and 1970 U.S. Census publications cited in notes 1, 2, and 3 above.

[6] There are relatively few differences in the number of blocks in each Census Tract for 1980; we have aggregated or proportionately assigned the 1980 population to 1970 blocks.

[7] The number of occupied dwelling units in each Census Tract is based on the 1950, 1960, and 1970 U.S. Census publications cited in notes 1, 2, and 3 above.

TABLE 2. POPULATION, NUMBER OF BLOCKS, AND NUMBER OF OCCUPIED DWELLING UNITS IN RACINE POLICE GRID AREAS: 1950 - 1980

Grid Number	POPULATION								BLOCKS								OCCUPIED DWELLING UNITS							
	1950		1960		1970		1980		1950		1960		1970		1980		1950		1960		1970		1980	
	N^1	%	N^2	%	N^3	%	N^4	%	N^5	%	N	%	N	%	N^6	%	N^7	%	N	%	N	%	N	%
Inner City and Interstitial Areas																								
8	8688	12.2	7900	8.8	7130	7.5	6211	7.3	97	9.2	99	8.2	91	7.5	91	7.5	2575	12.2	2498	9.2	2266	7.3	--	--
12	8857	12.4	7217	8.1	5558	5.8	4234	4.9	130	12.3	101	8.4	98	8.1	98	8.1	2625	12.4	2690	9.9	2208	7.2	--	--
13	8982	12.6	10217	11.4	8475	8.9	7656	9.0	111	10.5	111	9.2	108	8.9	108	8.9	2662	12.6	2833	10.4	2499	8.1	--	--
16	8601	12.1	8441	9.4	7108	7.5	6037	7.1	88	8.3	86	7.1	84	6.9	84	6.9	2549	12.1	2530	9.3	2154	7.0	--	--
20	94	.1	98	.1	325	.3	323	.4	6	.6	3	.2	3	.2	3	.2	28	.1	35	.1	85	.3	--	--
	35222	49.4	33873	37.8	28596	30.0	24461	28.7	432	40.9	400	33.1	384	31.6	384	31.6	10439	49.4	10586	38.9	9212	29.9		
Stable Residential Areas																								
4	4136	5.8	6497	7.3	6388	6.7	5289	6.2	85	8.1	87	7.3	84	6.9	84	6.9	1226	5.8	2227	8.2	2155	7.0	--	--
9	6626	9.3	8379	9.4	8534	9.0	6962	8.1	98	9.3	107	8.9	107	8.8	107	8.8	1964	9.3	2415	8.8	2554	8.3	--	--
14	4191	5.9	5740	6.4	5874	6.2	5595	6.5	64	6.1	77	6.4	75	6.2	75	6.2	1242	5.9	1833	6.7	2068	6.7	--	--
18	4832	6.8	8333	9.3	8961	9.4	7724	9.0	92	8.7	147	12.2	138	11.4	138	11.4	1432	6.8	2415	8.8	2785	9.0	--	--
17	9205	12.9	9088	10.2	8728	9.2	7321	8.6	121	11.5	117	9.7	117	9.6	117	9.6	2728	12.9	2861	10.5	2885	9.4	--	--
21	2864	4.0	6453	7.2	7032	7.4	6154	7.2	75	7.1	76	6.3	86	7.1	86	7.1	849	4.0	1843	6.8	2073	6.7	--	--
	31854	44.7	44490	49.8	45517	47.9	39045	45.6	535	50.8	611	50.8	607	50.0	607	50.0	9441	44.7	13594	49.8	14520	47.1		
Older Suburban Areas																								
1	168	.2	1552	1.7	3542	3.7	3267	3.8	2	.2	20	1.7	33	2.7	33	2.7	50	.2	404	1.5	1303	4.2	--	--
2	124	.2	818	.9	1594	1.7	1279	1.5	1	.1	11	.9	10	.8	10	.8	37	.2	206	.7	464	1.5	--	--
5	2996	4.2	4350	4.9	5498	5.8	4612	5.4	60	5.7	79	6.5	68	5.6	68	5.6	888	4.2	1312	4.8	2028	6.6	--	--
10	70	.1	518	.6	1303	1.4	1258	1.5	3	.3	15	1.2	13	1.1	13	1.1	20	.1	144	.5	452	1.5	--	--
22	759	1.1	3108	3.5	4604	4.8	4196	4.9	22	2.1	54	4.5	59	4.8	59	4.8	225	1.1	821	3.0	1425	4.6	--	--
	4117	5.8	10346	11.6	16541	17.4	14612	17.1	88	8.4	179	14.8	183	15.0	183	15.0	1220	5.8	2887	10.5	5672	18.4		
Newer Suburban Areas																								
6	0	.0	230	.3	399	.4	281	.3	0	.0	7	.6	5	.4	5	.4	0	.0	61	.2	173	.6	--	--
15	0	.0	553	.6	1614	1.7	1745	2.0	0	.0	7	.6	16	1.3	16	1.3	0	.0	147	.5	477	1.5	--	--
19	0	.0	0	.0	1526	1.6	2725	3.2	0	.0	3	.2	11	.9	11	.9	0	.0	0	.0	350	1.1	--	--
23	0	.0	0	.0	1133	1.2	2672	3.1	0	.0	0	.0	8	.7	8	.7	0	.0	0	.0	416	1.3	--	--
			783	.9	4612	4.9	7423	8.6			17	1.4	40	6.3	40	6.3			208	.7	1416	4.5		
TOTAL	71193	99.9	89492	100.1	95326	100.2	85541	100.0	1055	100.1	1207	100.1	1214	99.9	1214	99.9	21100	99.9	27275	99.9	30820	99.9		

FOOTNOTES - TABLE 2

[1] The 1950 U.S. Census of Housing (1950 Housing Census Report, Block Statistics, Vol. V, part 154 H-E154) for Racine, Wisconsin did not contain population counts for each block. Although we attempted to secure 1950 data from the Bureau of the Census, they were not available. Population estimates for each Police Grid Area in 1950 were obtained by multiplying the total population for Racine in 1950 by the percent of Racine's occupied dwelling units in that grid in 1950. This is considered the best possible population estimate for each Police Grid Area because the percent of the 1960 population for each grid area developed from block data had a correlation of .990 with the percent of the occupied dwelling units in each grid area. The same calculations for the 1970 data resulted in a correlation of .988. Similar calculations generated correlations of .959 and .974 between the percent of the blocks and the percent of the population in each grid area, blocks therefore being less precise units on which to base an estimate than occupied dwelling units. All calculations were carried out to two decimal places but rounded for presentation in this table.

[2] U.S. Census of Housing: 1960. City Blocks, Series HC (3) - 418.

[3] U.S. Census of Housing: 1970. Block Statistics, Series HC (3) 272.

[4] Census of Population and Housing, 1980. P.L. 94-171 Counts.

[5] The number of blocks in each grid area is based on the 1950, 1960, and 1970 U.S. Census publications cited in notes 1, 2, and 3 above.

[6] There are relatively few differences in the number of blocks in each grid area for 1980; we have aggregated and proportionately assigned the 1980 population to 1970 blocks.

[7] The number of occupied dwelling units in each grid area is based on the 1950, 1960, and 1970 U.S. Census publications cited in notes 1, 2, and 3 above.

TABLE 3. POPULATION, NUMBER OF BLOCKS, AND NUMBER OCCUPIED DWELLING UNITS IN 1970 NATURAL AREAS: 1950-1980

Natural Area	POPULATION								BLOCKS								OCCUPIED DWELLING UNITS							
	1950		1960		1970		1980		1950		1960		1970		1980		1950		1960		1970		1980	
	N[1]	%	N[2]	%	N[3]	%	N[4]	%	N[5]	%	N	%	N	%	N[6]	%	N[7]	%	N	%	N	%	N	%
Inner City																								
1	7546	10.6	7907	8.9	8197	8.4	6955	8.1	96	9.1	91	7.6	94	7.7	94	7.7	2231	10.6	2336	8.6	2382	7.7		
2	6620	9.3	6735	7.6	4800	4.9	3765	4.4	130	12.3	110	9.1	117	9.6	117	9.6	1970	9.3	2029	7.5	1535	5.0		
3	3630	5.1	2858	3.2	3157	3.2	2876	3.4	33	3.1	31	2.6	28	2.3	28	2.3	1070	5.1	932	3.4	972	3.2		
5	7831	11.0	6630	7.5	5203	5.3	4301	5.0	77	7.3	72	6.0	64	5.3	64	5.3	2314	11.0	2387	8.8	2046	6.6		
	25627	36.0	24130	27.2	21357	21.8	17897	20.9	336	31.8	304	25.3	303	24.9	303	24.9	7585	36.0	7684	28.4	6935	22.5		
Transition																								
4	8187	11.5	7327	8.2	5952	6.1	5089	6.0	89	8.4	88	7.3	83	6.8	83	6.8	2425	11.5	2358	8.7	1994	6.5		
6	2349	3.3	2159	2.4	2334	2.4	2134	2.5	23	2.2	23	1.9	23	1.9	23	1.9	704	3.3	649	2.4	673	2.2		
8	1210	1.7	3597	4.0	4715	4.8	3952	4.6	33	3.1	80	6.6	73	6.0	73	6.0	353	1.7	923	3.4	1322	4.3		
	11746	16.5	13083	14.6	13001	13.3	11175	13.1	145	13.7	191	15.8	179	14.7	179	14.7	3482	16.5	3930	14.5	3989	13.0		
Stable Residential Areas																								
21	1352	1.9	1260	1.4	1502	1.5	1217	1.4	18	1.7	15	1.2	15	1.2	15	1.2	405	1.9	409	1.5	427	1.4		
13	5268	7.4	5715	6.4	4687	4.8	3785	4.4	73	6.9	75	6.2	64	5.3	64	5.3	1570	7.4	1841	6.8	1626	5.3		
12	1423	2.0	3763	4.2	6248	6.4	4608	5.4	33	3.1	71	5.9	58	4.8	58	4.8	421	2.0	1017	3.8	1939	6.3		
9	2705	3.8	3219	3.6	3339	3.4	2786	3.3	44	4.2	42	3.5	39	3.2	39	3.2	806	3.8	942	3.5	996	3.2		
14	2847	4.0	3110	3.5	3383	3.5	2900	3.4	44	4.2	43	3.6	43	3.5	43	3.5	842	4.0	966	3.6	1086	3.5		
11	3773	5.3	3545	4.0	3354	3.4	2957	3.5	38	3.6	37	3.1	42	3.5	42	3.5	1118	5.3	1141	4.2	1163	3.8		
10	5054	7.1	5192	5.8	4888	5.0	4108	4.8	63	6.0	63	5.2	63	5.2	63	5.2	1489	7.1	1596	5.9	1615	5.2		
	22422	31.5	25804	28.9	27401	28.0	22361	26.2	313	29.7	346	28.7	324	26.7	324	26.7	6651	31.5	7912	29.2	8852	28.7		
New & Peripheral Residential Areas																								
7					531	0.5	491	0.6					4	0.3	4	0.3					117	0.4		
18	711	1.0	4129	4.6	7330	7.5	5625	6.6	27	2.6	57	4.7	68	5.6	68	5.6	213	1.0	1080	4.0	2153	7.0		
19	1067	1.5	3553	4.0	4336	4.4	3571	4.2	30	2.8	58	4.8	61	.5.0	61	5.0	307	1.5	954	3.5	1273	4.1		
16	2491	3.5	3480	3.9	3098	3.2	2639	3.1	42	4.0	53	4.4	48	4.0	48	4.0	731	3.5	1111	4.1	1035	3.4		
20	3346	4.7	5737	6.5	6765	6.9	6134	7.2	54	5.1	83	6.9	80	6.6	80	6.6	987	4.7	1779	6.6	2152	7.0		
22					1526	1.6	2725	3.2					11	0.9	11	0.9					350	1.1		
	7615	10.7	16899	19.0	23586	24.1	21185	24.9	153	14.5	251	20.8	272	22.4	272	22.4	2238	10.7	4924	18.2	7080	23.1		
Peripheral High SES Residential Areas																								
25	1637	2.3	3211	3.6	3457	3.5	2974	3.5	41	3.9	45	3.7	43	3.5	43	3.5	483	2.3	978	3.6	1162	3.8		
17	2206	3.1	5779	6.5	5849	6.0	5021	5.9	67	6.4	68	5.6	74	6.1	74	6.1	661	3.1	1626	6.0	1764	5.7		
23					1241	1.3	1248	1.5					9	0.7	9	0.7					390	1.3		
26					725	0.7	1368	1.6					2	0.2	2	0.2					256	0.8		
24					1354	1.4	2266	2.7					8	0.7	8	0.7					416	1.3		
	3843	5.4	8990	10.1	12626	12.9	12877	15.2	108	10.3	113	9.3	136	11.2	136	11.2	1144	5.4	2604	9.6	3988	12.9		
TOTAL	71253	100.1	88906	99.8	97971	100.1	85495	100.3	1055	100.0	1205	99.9	1214	99.9	1214	99.9	21100	100.1	27054	100.0	30844	100.2		

[1-7] These footnotes are the same as for Tables 1 and 2.

TABLE 4. POPULATION, NUMBER OF BLOCKS, AND NUMBER OCCUPIED DWELLING UNITS IN 1970 NEIGHBORHOODS: 1950-1980

Neighborhoods	POPULATION								BLOCKS								OCCUPIED DWELLING UNITS							
	1950		1960		1970		1980		1950		1960		1970		1980		1950		1960		1970		1980	
	N^1	%	N^2	%	N^3	%	N^4	%	N^5	%	N	%	N	%	N^6	%	N^7	%	N	%	N	%	N	%
1	783	1.1	554	0.6	309	0.3	278	0.3	15	1.8	21	1.7	26	2.1	26	2.1	236	1.1	331	1.2	212	0.7		
2	2919	4.1	2877	3.2	2482	2.5	2208	2.5	23	2.8	24	2.0	24	2.0	24	1.9	865	4.1	855	3.2	719	2.3		
3	--	--	6	0.0	194	0.2	199	0.2	--	--	1	0.1	1	0.1	1	0.1	--	--	4	-0.1	44	0.1		
4	2136	3.0	1981	2.2	1999	2.0	1583	1.8	24	2.9	24	2.0	24	2.0	24	1.9	635	3.0	619	2.3	646	2.1		
5	2919	4.1	2852	3.2	2532	2.6	2209	2.5	23	2.8	25	2.1	25	2.1	25	2.0	859	4.1	857	3.2	813	2.6		
6	2919	4.1	2055	2.3	1778	1.8	1386	1.6	21	2.5	21	1.7	22	1.8	22	1.8	869	4.1	892	3.3	868	2.8		
7	2919	4.1	3107	3.5	2100	2.1	1521	1.7	27	3.2	26	2.2	24	2.0	24	1.9	875	4.1	901	3.3	627	2.0		
8	2634	3.7	2337	2.6	2589	2.6	2104	2.4	23	2.8	23	1.9	23	1.9	23	1.9	788	3.7	748	2.8	707	2.3		
9	1424	2.0	1957	2.2	1766	1.8	1493	1.7	24	2.9	26	2.2	25	2.1	25	2.0	431	2.0	484	1.8	486	1.6		
10	2349	3.3	2108	2.4	1880	1.9	1581	1.8	21	2.5	22	1.8	23	1.9	23	1.9	693	3.3	716	2.6	635	2.1		
11	1353	1.9	1216	1.4	793	0.8	659	0.8	14	1.7	18	1.5	16	1.3	16	1.3	396	1.9	397	1.5	250	0.8		
12	3132	4.4	2819	3.2	2289	2.3	1771	2.0	31	3.7	31	2.6	28	2.3	28	2.3	931	4.4	895	3.3	699	2.3		
13	3560	5.0	2811	3.2	2842	2.9	2759	3.2	24	2.9	26	2.2	23	1.9	23	1.9	1054	5.0	844	3.1	827	2.7		
14	2136	3.0	2357	2.7	2512	2.6	2113	2.4	28	3.4	29	2.4	30	2.5	30	2.4	628	3.0	732	2.7	808	2.6		
15	1139	1.6	1504	1.7	1439	1.5	1105	1.3	15	1.8	19	1.6	18	1.5	18	1.5	340	1.6	431	1.6	463	1.5		
16	2065	2.9	2049	2.3	2011	2.1	1788	2.0	18	2.2	22	1.8	23	1.9	23	1.9	619	2.9	629	2.3	632	2.0		
17	1780	2.5	1654	1.9	1414	1.4	1286	1.5	24	2.9	26	2.2	26	2.1	26	2.1	537	2.5	522	1.9	464	1.5		
18	2207	3.1	1965	2.2	1877	1.9	1539	1.8	28	3.4	28	2.3	30	2.5	30	2.4	660	3.1	648	2.4	628	2.0		
19	2349	3.3	2247	2.5	1873	1.9	1600	1.8	24	2.9	26	2.2	24	2.0	24	1.9	691	3.3	707	2.6	638	2.1		
20	2207	3.1	2102	2.4	1907	1.9	1643	1.9	23	2.8	24	2.0	24	2.0	24	1.0	655	3.1	689	2.5	670	2.2		
21	1993	2.8	2177	2.4	2282	2.3	1779	2.0	25	3.0	26	2.2	26	2.1	26	2.1	581	2.8	702	2.6	786	2.5		
22	1922	2.7	2149	2.4	1952	2.0	1662	1.9	26	3.1	27	2.2	27	2.2	27	2.2	563	2.7	689	2.5	688	2.2		
23	712	1.0	1586	1.8	2066	2.1	1658	1.9	16	1.9	23	1.9	23	1.9	23	1.9	221	1.0	432	1.6	639	2.1		
24	--	--	16	0.0	1677	1.7	1084	1.2	--	--	1	0.1	8	0.7	8	0.6	--	--	4	-0.1	554	1.8		
25	--	--	1430	1.6	2412	2.5	1911	2.2	--	--	21	1.7	23	1.9	23	1.9	--	--	357	1.3	629	2.0		

TABLE 4. cont.
Page 2.

Neighborhoods	POPULATION								BLOCKS								OCCUPIED DWELLING UNITS							
	1950		1960		1970		1980		1950		1960		1970		1980		1950		1960		1970		1980	
	N[1]	%	N[2]	%	N[3]	%	N[4]	%	N[5]	%	N	%	N	%	N[6]	%	N[7]	%	N	%	N	%	N	%
26	--	--	439	0.5	1059	1.1	836	1.0	--	--	4	0.3	7	0.6	7	0.6	--	--	128	0.5	316	1.0		
27	570	0.8	1358	1.5	1243	1.3	1079	1.2	16	1.9	21	1.7	19	1.6	19	1.5	160	0.8	400	1.5	428	1.4		
28	570	0.8	2084	2.3	2016	2.1	1644	1.9	18	2.2	30	2.5	30	2.5	30	2.4	179	0.8	579	2.1	609	2.0		
29	926	1.3	1303	1.5	2935	3.0	2152	2.5	15	1.8	36	3.0	24	2.0	24	1.9	282	1.3	384	1.4	1040	3.4		
30	72	0.1	548	0.6	1383	1.4	892	1.0	2	0.2	11	0.9	11	0.9	11	0.9	20	0.1	144	0.5	371	1.2		
31	427	0.6	1885	2.1	1930	2.0	1564	1.8	6	0.7	22	1.8	21	1.7	21	1.7	119	0.6	481	1.8	528	1.7		
32	3417	4.8	3269	3.7	3250	3.3	2682	3.1	33	4.0	34	2.8	36	3.0	36	2.9	1003	4.8	1005	3.7	1013	3.3		
33	1353	1.9	1848	2.1	1771	1.8	1474	1.7	16	1.9	22	1.8	24	2.0	24	1.9	397	1.9	545	2.0	592	1.9		
34	285	0.6	1276	1.4	1179	1.2	917	1.1	10	1.2	23	1.9	24	2.0	24	1.9	88	0.4	344	1.3	343	1.1		
35	1993	2.8	1987	2.2	1993	2.0	1683	1.9	23	2.8	25	2.1	24	2.0	24	1.9	586	2.8	627	2.3	671	2.2		
36	1851	2.6	2545	2.9	2307	2.4	1994	2.3	22	2.6	23	1.9	23	1.9	23	1.9	554	2.6	817	3.0	819	2.7		
37	--	--	--	--	--	--	814	0.9	--	--	--	--	--	--	13	1.0	--	--	--	--	--	--		
38	36	-0.1	1541	1.7	2419	2.5	2223	2.5	2	0.2	15	1.2	21	1.7	21	1.7	10	-0.1	357	1.3	581	1.9		
39	498	0.7	1132	1.3	1552	1.6	1430	1.6	7	0.8	17	1.4	17	1.4	17	1.4	146	0.7	339	1.3	451	1.5		
40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
41	--	--	3	0.0	964	1.0	1307	1.5	--	--	7	0.6	9	0.7	9	0.7	--	--	--	--	242	0.8		
42	--	--	553	0.6	1570	1.6	1276	1.5	--	--	7	0.6	13	1.1	13	1.0	--	--	147	0.5	424	1.4		
46	14	-0.1	1261	1.4	1653	1.7	1476	1.7	1	0.1	31	2.6	32	2.6	32	2.6	5	-0.1	330	1.2	445	1.4		
47	641	0.9	1454	1.6	1645	1.7	1325	1.5	12	1.4	20	1.7	20	1.6	20	1.6	194	0.9	390	1.4	497	1.6		
48	--	--	--	--	1347	1.4	2605	3.0	--	--	--	--	8	0.7	8	0.6	--	--	--	--	304	1.0		
49	570	0.8	1700	1.9	1778	1.8	1503	1.7	13	1.6	26	2.2	26	2.1	26	2.1	171	0.8	463	1.7	548	1.8		
50	--	--	1288	1.4	1974	2.0	1635	1.9	--	--	23	1.9	27	2.2	27	2.2	--	--	324	1.2	525	1.7		
51	142	0.2	1256	1.4	1120	1.1	947	1.1	7	0.8	20	1.7	20	1.6	20	1.6	34	0.2	368	1.4	381	1.2		
52	1281	1.8	1407	1.6	1264	1.3	1201	1.4	17	2.0	17	1.4	17	1.4	17	1.4	387	1.8	486	1.8	462	1.5		
53	1993	2.8	1892	2.1	1747	1.8	1593	1.8	18	2.2	20	1.7	20	1.6	20	1.6	593	2.8	616	2.3	609	2.0		
54	1139	1.6	1792	2.0	2042	2.1	1612	1.8	19	2.3	28	2.3	27	2.2	27	2.2	333	1.6	648	1.7	572	1.9		
55	356	0.5	1195	1.3	1321	1.3	1110	1.3	11	1.3	22	1.8	22	1.8	22	1.8	100	0.5	350	1.3	419	1.4		
56	2919	4.1	2654	3.0	2429	2.5	2226	2.5	31	3.7	32	2.7	32	2.6	32	2.6	858	4.1	898	3.3	887	2.9		
57	--	--	--	--	--	--	1050	1.2	--	--	--	--	--	--	15	1.2	--	--	--	--	--	--		
58	--	--	--	--	152	0.2	234	0.3	--	--	--	--	1	0.1	1	0.1	--	--	--	--	41	0.1		
59	--	--	--	--	1354	1.4	2266	2.6	--	--	--	--	8	0.7	8	0.6	--	--	--	--	416	1.3		
60	498	0.7	566	0.6	242	0.2	155	0.2	10	1.2	24	2.0	22	1.8	22	1.8	143	0.7	148	0.5	71	0.2		
61	356	0.5	344	0.3	102	0.1	88	0.1	8	1.0	22	1.8	19	1.6	19	1.5	109	0.5	88	0.3	38	0.1		
62	926	1.3	1324	1.5	729	0.7	780	0.9	6	0.7	14	1.2	12	1.0	12	1.0	282	1.3	451	1.7	278	0.9		
63	214	0.3	445	0.5	806	0.8	723	0.8	3	0.4	6	0.5	7	0.6	7	0.6	64	0.3	112	0.4	169	0.5		
64	142	0.2	149	0.2	87	0.0	93	0.1	2	0.2	10	0.8	7	0.6	7	0.6	41	0.2	46	0.2	33	0.1		
65	356	0.5	268	0.3	154	0.2	177	0.2	7	0.8	10	0.8	3	0.2	3	0.2	105	0.5	74	0.3	57	0.2		
66	--	--	82	0.1	87	0.0	64	0.1	--	--	14	1.2	5	0.4	5	0.4	--	--	22	0.1	27	0.1		
67	36	-0.1	105	0.1	744	0.8	1264	1.4	2	0.2	6	0.5	5	0.4	5	0.4	10	-0.1	29	0.1	267	0.9		
68	--	--	--	--	179	0.2	120	0.1	--	--	1	0.1	3	0.2	3	0.2	--	--	--	--	46	0.1		
70	--	--	37	0.0	437	0.4	197	0.2	--	--	2	0.2	1	0.1	1	0.1	--	--	9	-0.1	184	0.6		
TOTAL	71193	100.1	88906	99.6	97971	99.7	87330	99.8	834	100.1	1205	99.9	1213	100.1	1241	100.1	21100	100.1	27054	99.7	30844	99.9		

[1-7] These footnotes are the same as for Tables 1 and 2.

TABLE 5. BLOCK DEMOGRAPHICS FOR CENSUS TRACTS: 1950-1980

	Mean % Occupied Units Occupied by Blacks			Change 1950-70	Mean % Pop. Black	Mean % Fem. Heads of Households	Mean # Occupied Dwelling Units Per Block			Change 1950-70	Mean # Persons in Blocks		
	1950	1960	1970		1970	1970	1950	1960	1970		1960	1970	1980
Inner City and Interstitial Areas													
1	3.19	2.28	6.31	↓	7.44	4.7	7.09	16.21	7.57	↑	26.58	11.04	12.08
3	5.06	20.64	50.98	Inc.	59.34	17.7	20.91	22.67	17.85	↑	74.67	60.64	50.05
4	3.24	12.05	21.63	Inc.	26.79	13.9	23.37	23.71	22.07	Stable	76.91	73.20	59.68
5	5.38	21.39	34.28	Inc.	44.00	15.4	23.37	24.02	24.93	Stable	82.05	83.63	76.54
Heterogeneous Transition Areas													
2	.49	.39	7.70	Inc.	10.33	10.3	32.78	33.68	32.38	Stable	98.92	88.56	72.76
6	.11	.27	.84	Inc.	.97	8.7	23.70	27.31	27.59	Stable	86.95	84.84	71.51
Older Stable Residential Areas													
7	.12	.22	.86	Inc.	1.33	5.9	17.07	24.78	23.89	Stable	81.53	71.35	59.75
13	.04	.13	1.11	Inc.	1.26	7.4	24.38	26.86	26.59	Stable	83.06	77.41	64.71
Southwestern Fringe Areas													
8	.00*	.00	3.81	Inc.	3.75	4.7	.59	21.24	27.48	Inc.	91.00	114.92	105.16
9	.00	.16	.44	Inc.	2.46	4.8	9.24	14.12	25.31	Inc.	53.21	84.41	90.43
10	.23	.07	.64	↓	1.20	6.0	17.45	17.97	21.25	Inc.	58.99	70.05	70.35
Northwestern Fringe Areas													
11	.00	.00	.12	Inc.	.17	5.6	22.02	22.74	30.22	Inc.	74.67	96.00	88.95
12	2.17	.06	.92	↓	1.01	6.0	15.33	16.62	30.25	Inc.	58.88	98.63	76.26
14	.00	.49	.28	↑	.69	6.3	7.31	18.42	25.87	Inc.	67.13	87.27	70.25

* Fewer than 5 blocks in city limits in Census Tract.

↓↑ Indicates 1950-1960 trend differs from 1950-1970 trend.

TABLE 6. BLOCK DEMOGRAPHICS FOR POLICE GRID AREAS: 1950-1980

	Mean % Occupied Units Occupied by Blacks			Change 1950-70	Mean % Pop. Black	Mean % Fem. Heads of Households	Mean # Occupied Dwelling Units Per Block			Change 1950-70	Mean # Persons in Blocks		
	1950	1960	1970		1970	1970	1950	1960	1970		1960	1970	1980
Inner City and Interstitial Areas													
8	.82	1.67	5.33	Inc.	8.43	10.2	26.55	25.23	24.93	Dec.	79.80	78.35	68.25
12	2.28	8.86	17.84	Inc.	23.97	11.2	20.04	26.63	22.53	↑	71.46	56.71	43.20
13	3.42	15.93	23.72	Inc.	31.64	13.3	24.20	25.52	23.14	↑	86.77	78.47	70.89
16	3.99	11.59	27.67	Inc.	32.27	14.1	28.97	29.42	25.64	↑	98.15	84.62	71.87
Partially in Transition													
9	1.40	4.34	8.39	Inc.	10.78	8.9	20.04	22.57	23.87	Inc.	78.31	79.76	65.06
17	1.98	5.50	8.16	Inc.	12.52	10.0	22.55	24.45	24.66	Stable	77.68	74.60	62.57
Stable Residential Areas													
4	.00	.07	.00	--	.24	5.7	14.42	22.91	25.66	Inc.	74.68	76.05	62.96
14	.00	.00	.10	--	.16	6.1	19.41	23.81	27.57	Inc.	75.55	80.45	74.64
18	.23	.15	.65	--	1.85	6.4	15.57	16.52	20.18	Inc.	56.69	64.94	55.97
21	.00	.00	.07	--	.42	4.8	11.32	24.25	24.35	Inc.	84.91	81.22	69.94
Peripheral High Target or Recently Developing Areas													
5	1.89	.66	.32	Dec.	.66	7.3	14.80	16.61	29.82	Inc.	55.05	87.63	67.82
6	--	.00*	.00*	--	.20	3.6	--	8.71	34.60	Inc.	32.86	133.60	56.20
15	--	.00	.13	--	.06	3.4	--	21.00	29.81	Inc.	79.00	112.38	109.06
22	.00	.00	.51	--	1.95	4.2	10.23	15.20	24.15	Inc.	57.56	81.80	79.58
20	.00*	.00*	37.50*	Inc.	40.00*	9.5*	4.67*	11.67*	28.33*	Inc.	32.67*	120.00*	107.67
Suburban Residential													
1	.00*	.00	.39	--	.39	4.6	25.00*	20.20	39.49	Inc.	77.60	133.36	99.00
2	.00*	.00	1.30	--	1.20	9.4	37.00*	18.73	46.40	Inc.	74.36	159.40	127.90
10	.00*	.00	.83	--	.67	5.3	6.67*	9.60	34.77	Inc.	34.53	121.85	96.77
19	--	.00*	1.43	--	2.56	3.0	--	.00*	31.82	Inc.	.00*	138.73	247.73
23	--	--	.25	--	.38	4.4	--	--	52.00	--	--	169.25	334.00

[illegible] as in Table 5

* Fewer than 5 blocks in city limits in Grid Area.

TABLE 7. BLOCK DEMOGRAPHICS FOR NATURAL AREAS: 1950-1980

	Mean % Occupied Units Occupied by Blacks			Change 1950-70	Mean % Pop. Black	Mean % Fem. Heads of Households	Mean # Occupied Dwelling Units Per Block			Change 1950-70	Mean # Persons in Blocks		
	1950	1960	1970		1970	1970	1950	1960	1970		1960	1970	1980
Inner City													
1	4.96	16.24	30.53	Inc.	35.14	15.5	29.75	28.84	27.70	Stable	86.89	87.20	73.99
2	8.85	33.41	45.77	Inc.	55.35	16.2	22.64	22.54	18.06	Dec.	61.23	41.03	32.18
Interstitial Areas													
3	.00	1,56	23.48	Inc.	28.23	14.0	38.21	35.84	37.38	Stable	92.19	112.75	102.71
4	.06	.45	.84	Inc.	1.10	8.2	28.20	27.42	25.24	Dec.	83.26	71.71	61.31
5	.32	.76	14.83	Inc.	16.24	10.6	36.73	35.63	37.20	Stable	92.08	81.30	67.20
6	.83	.77	25.20	Inc.	29.71	11.2	35.20	30.91	32.05	Dec.	93.87	101.48	92.78
7	--	--	1.25*	--	1.25*	8.8*	--	--	29.25*	--	--	132.75*	122.75*
8	.00	.31	1.13	Inc.	3.55	5.8	16.04	13.57	19.44	Stable	44.41	64.59	54.14
Stable Residential													
9	.07	.00	3.13	Inc.	3.36	7.7	27.79	30.39	30.18	Stable	76.64	85.62	71.43
10	.16	.33	1.92	Inc.	2.17	7.8	26.59	28.50	31.06	Inc.	82.41	77.59	65.21
11	.00	.46	.51	Inc.	.89	8.0	30.22	30.84	30.60	Stable	95.81	79.86	70.40
12	4.85	.28	.43	Dec.	.44	5.2	18.30	16.67	35.25	Inc.	53.00	107.72	79.45
13	.00	.46	.00	↑	.40	8.4	23.09	25.57	25.81	Inc.	76.20	73.23	59.14
14	.20	.00	.31	↓	.36	8.7	24.76	26.83	30.17	Inc.	72.33	78.67	67.44
Peripheral Middle Class Residential													
15	--	--	--*	--	--*	--*	--	--	--*		--	--*	--*
16	.46	.00	.28	↓	.77	6.2	20.88	21.36	22.02	Stable	65.66	64.52	54.98
17	.00	.00	.00	--	.42	4.5	18.36	25.01	25.20	Inc.	84.99	79.04	69.85
18	.00	.22	.43	Inc.	.68	5.6	10.14	19.63	31.66	Inc.	72.44	107.79	82.72
19	.00	.00	.31	Inc.	1.16	4.7	13.95	18.35	21.57	Inc.	61.26	71.08	58.54
20	.00	.00	.12	Inc.	.15	5.7	23.50	24.37	27.24	Inc.	69.12	84.56	76.67
Upper Class Residential													
21	.00	.00	.67	Inc.	1.67	9.9	23.82	27.27	28.47	Inc.	84.00	100.13	81.13
22	--	--	1.43	--	2.56	3.0	--	--	38.89	--	--	138.73	247.73
23	--	--	.00	--	.00	1.6	--	--	43.33	--	--	137.89	138.67
24	--	--	.25	--	.38	4.4	--	--	52.00	--	--	169.25	282.25
25	.00	.00	.05	Inc.	.05	4.4	14.64	21.73	27.02	Inc.	71.36	80.40	69.16
26	--	--	--	--	--	--	--	--	--	--	--	--	--*

[illegible] then insert [illegible] arrow footnote just [illegible] it [illegible] Table 5

* Fewer than 5 blocks in city limits

TABLE 8. BLOCK DEMOGRAPHICS FOR NEIGHBORHOODS: 1950-1980

Neighborhoods	Mean % of Pop. Black 1970	Mean % of Fem. Heads of Household 1970	Mean # Occupied Dwelling Units Per Block			Change 1950-1970	Mean Number Persons in Blocks			Change 1960-1980	Mean % Occupied Units Black			Change 1950-1980
			1950	1960	1970		1960	1970	1980		1950	1960	1970	
1	7.4	4.7	15.7	18.4	12.5	Dec.	26.4	11.9	10.7	Dec.	2.1	2.4	6.3	Inc.
2	68.9	16.7	37.6	37.2	31.3	Dec.	119.9	103.4	92.0	Dec.	11.3	26.8	62.2	Inc.
3	47.0	15.8	--	4.0	44.0	Inc.	6.0	194.0	199.0	Inc.	--	--	40.4	Inc.
4	2.3	8.7	26.5	25.8	28.1	Inc.	82.5	83.3	66.0	Dec.	0.7	0.0	1.0	Stable
5	15.8	12.0	37.4	34.3	32.5	Dec.	114.1	101.3	88.4	Dec.	0.6	0.9	11.9	Inc.
6	8.0	6.8	41.4	47.0	45.7	Inc.	97.9	80.8	63.0	Dec.	0.3	0.2	5.4	Inc.
7	44.3	18.0	32.4	34.7	27.3	Dec.	119.5	87.5	63.4	Dec.	5.8	21.5	47.4	Inc.
8	36.8	15.5	34.3	32.5	30.7	Dec.	101.6	112.6	91.5	Dec.	2.1	12.3	32.4	Inc.
9	79.5	18.9	18.0	19.4	21.1	Inc.	75.3	70.6	59.7	Dec.	11.5	51.4	70.0	Inc.
10	21.3	12.3	33.0	34.1	30.2	Dec.	95.8	81.7	68.7	Dec.	0.7	10.6	14.8	Inc.
11	49.8	22.8	28.3	26.5	17.9	Dec.	67.6	49.6	41.2	Dec.	6.7	20.9	38.9	Inc.
12	45.6	16.8	30.0	29.8	28.0	Stable	90.9	81.8	63.3	Dec.	0.9	8.7	36.3	Inc.
13	34.6	13.5	43.9	32.5	39.4	Dec.	108.1	123.6	120.0	Inc.	2.9	9.7	28.1	Inc.
14	0.3	9.2	22.4	25.2	26.9	Inc.	81.3	83.7	70.4	Dec.	0.0	0.0	0.2	Stable
15	0.3	6.2	22.7	25.4	25.7	Inc.	79.2	79.9	61.4	Dec.	0.0	0.0	0.1	Stable
16	17.2	13.4	34.4	33.1	33.3	Stable	93.1	87.4	77.7	Dec.	1.2	3.5	14.9	Inc.
17	10.0	11.5	22.4	20.9	18.6	Dec.	63.6	54.4	49.5	Dec.	0.0	1.5	1.6	Stable
18	1.9	7.5	23.6	23.1	21.7	Dec.	70.2	62.6	51.3	Dec.	0.1	0.2	0.9	Stable
19	0.5	8.2	28.8	28.3	27.7	Stable	86.4	78.0	66.7	Dec.	0.0	0.0	0.5	Stable
20	0.1	6.2	28.5	31.3	29.1	Stable	87.6	79.5	68.5	Dec.	0.0	0.1	0.1	Stable
21	0.0	5.8	23.2	27.0	30.2	Inc.	83.7	87.8	68.4	Dec.	0.0	0.0	0.0	Stable
22	0.0	8.2	21.7	25.5	25.5	Inc.	79.6	72.3	61.6	Dec.	0.0	0.0	0.0	Stable
23	1.7	9.4	13.8	18.8	27.8	Inc.	69.0	89.8	72.1	Inc.	0.0	1.7	0.8	Stable
24	0.4	3.5	--	4.0	69.3	Inc.	16.0	209.6	135.5	Inc.	--	0.0	0.4	Stable
25	0.4	6.3	--	18.8	27.3	Inc.	68.1	104.9	83.1	Inc.	--	0.0	0.4	Stable

TABLE 8. cont.
Page 2.

Neighborhoods	Mean % of Pop. Black 1970	Mean % of Fem. Heads of Household 1970	Mean # Occupied Dwelling Units Per Block			Change 1950-1970	Mean Number Persons in Blocks			Change 1960-1980	Mean % Occupied Units Black			Change 1950-1980
			1950	1960	970		1960	1970	1980		1950	1960	1970	
26	0.1	4.3	--	32.0	45.1	Inc.	109.8	151.3	119.4	Inc.	--	0.0	1.3	Stable
27	0.1	4.8	10.0	19.0	22.5	Inc.	64.7	65.4	56.8	Dec.	0.0	0.0	0.0	Stable
28	0.6	4.9	9.9	19.3	20.3	Inc.	69.5	67.2	54.8	Dec.	0.0	0.2	0.0	Stable
29	0.7	6.3	18.8	14.2	45.2	Inc.	36.2	122.3	89.7	Inc.	6.8	0.4	0.6	Dec.
30	0.8	4.3	10.0	13.1	33.7	Inc.	49.8	125.7	81.1	Inc.	0.0	0.0	1.0	Stable
31	0.0	4.5	19.8	21.9	25.1	Inc.	85.7	91.9	74.5	Dec.	0.0	0.2	0.0	Stable
32	1.4	8.5	30.4	30.5	32.7	Inc.	96.1	90.3	74.5	Dec.	0.0	0.0	1.3	Stable
33	4.4	8.3	24.8	26.0	25.7	Stable	84.0	73.8	61.4	Dec.	0.6	0.6	3.3	Inc.
34	0.0	4.6	8.8	15.6	15.6	Inc.	55.5	49.1	38.2	Dec.	0.0	0.0	0.0	Stable
35	0.4	6.0	25.5	27.3	29.2	Inc.	79.5	83.0	70.1	Dec.	0.0	0.0	0.4	Stable
36	0.6	4.8	25.2	37.1	37.2	Inc.	110.7	100.3	86.7	Dec.	0.0	0.0	0.0	Stable
37	9.8	5.7	--	--	--	--	--	--	62.6	Inc.	--	--	6.6	Inc.
38	0.5	4.4	5.0	25.5	27.7	Inc.	102.7	115.2	105.9	Stable	0.0	0.0	0.3	Stable
39	0.1	5.7	20.9	22.6	26.5	Inc.	66.6	91.3	84.1	Inc.	0.0	0.0	0.2	Stable
41	0.0	2.3	--	0.0	26.9	Inc.	0.4	107.1	145.2	Inc.	--	--	0.0	Stable
42	0.2	4.0	--	21.0	32.6	Inc.	79.0	120.8	98.2	Inc.	--	0.0	0.3	Stable
46	3.0	3.3	5.0	11.0	14.4	Inc.	40.7	51.7	46.1	Inc.	0.0	0.3	1.5	Stable
47	0.1	5.3	16.2	20.5	24.9	Inc.	72.7	82.3	66.3	Dec.	0.0	0.0	0.0	Stable
48	2.8	3.4	--	--	38.0	Inc.	--	168.4	325.6	Inc.	--	--	1.4	Stable
49	6.1	6.5	13.2	17.8	21.1	Inc.	65.4	68.4	57.8	Dec.	0.0	0.5	0.6	Stable
50	1.6	3.5	--	14.7	19.4	Inc.	56.0	73.1	60.6	Inc.	--	0.0	0.4	Stable
51	0.0	6.6	4.9	18.4	19.1	Inc.	62.8	56.0	47.4	Dec.	0.0	0.0	0.0	Stable
52	0.5	5.2	22.8	28.6	27.2	Inc.	82.8	74.4	70.6	Dec.	0.0	0.0	0.3	Stable
53	0.1	7.5	32.9	32.4	32.1	Stable	94.6	87.4	79.7	Dec.	0.0	0.0	0.0	Stable
54	1.0	8.6	17.5	18.0	22.9	Inc.	64.0	75.6	59.7	Dec.	0.7	0.0	0.9	Stable
55	1.0	6.4	9.1	15.9	19.0	Inc.	54.3	60.0	50.5	Dec.	0.0	0.0	0.6	Stable
56	0.0	7.1	27.7	28.1	27.7	Stable	82.9	75.9	69.6	Dec.	0.1	0.0	0.0	Stable
57	0.5	5.1	--	--	--	--	--	--	70.0	Inc.	--	--	0.4	Stable
58	0.4	1.5	--	--	41.0	Inc.	--	152.0	234.0	Inc.	--	--	0.6	Stable
59	0.3	3.5	--	--	52.0	Inc.	--	169.3	283.3	Inc.	--	--	0.2	Stable
60	14.7	10.3	14.3	16.4	17.8	Inc.	23.6	11.0	70.4	Dec.	0.8	8.6	0.0	Dec.
61	51.5	8.0	13.6	9.8	7.6	Dec.	15.6	5.4	4.6	Dec.	7.9	54.7	42.0	Inc.
62	9.5	9.0	47.0	56.4	69.5	Inc.	94.6	60.8	65.0	Dec.	1.1	2.2	8.0	Inc.
63	0.4	6.2	21.3	28.0	33.8	Inc.	74.2	115.1	103.3	Inc.	0.0	0.0	0.6	Stable
64	7.5	13.0	20.5	15.3	16.5	Dec.	14.9	12.4	13.3	Stable	0.0	0.0	9.5	Inc.
65	5.5	13.5	15.0	14.8	28.5	Inc.	26.8	51.3	59.0	Inc.	10.5	8.9	0.0	Dec.
66	0.0	0.0	--	5.5	27.0	Inc.	5.9	17.4	12.8	Inc.	--	0.0	0.0	Stable
67	1.7	4.7	5.0	9.7	66.8	Inc.	17.5	148.8	252.8	Inc.	0.0	0.0	1.3	Stable
68	0.5	3.0	--	--	46.0	Inc.	0.0	59.7	40.0	Inc.	--	--	0.0	Stable
70	0.0	5.5	--	9.0	184.0	Inc.	18.5	437.0	197.0	Inc.	--	0.0	0.0	Stable

to urban areas and the outward movement of the White population, the housing that has been available has continued to be in the inner city and interstitial areas.

It is therefore not surprising that census tracts in the inner city and interstitial areas (Table 5) have had an increasing proportion of Blacks as measured by the mean percent of occupied dwelling units occupied by Blacks (in Tract 3 from 5% to 30%, for example) and as measured by the mean percent of the tract's population that is Black (60% in Tract 3). Likewise, these are the blocks with the highest average percent of households headed by females.

The outward movement of the population is shown by the next two sets of data, mean number of occupied dwelling units per block and mean number of persons per block. The classic movement of people away from the inner city and interstitial areas is shown by increases in the mean number of occupied dwelling units per block, mean number of persons in each block in most fringe areas, and by decreases or stability in the number of dwelling units and size of the population in the inner city and interstitial areas. While the mean number of occupied dwelling units has been stable or increased slightly in the transitional or older stable residential areas, the mean number of persons per block has decreased. If there was a question of whether a tract, grid area, or natural area should be characterized as stable, as increasing, or as decreasing in the mean number of occupied dwelling units, emphasis was placed on change or lack of change between 1960 and 1970.

What we shall see, with more precision than previously shown, is an increase in the rate of crime in areas which have shown decreases in population and certain kinds of targets.

Block demographics for police grid areas are shown in Table 6. Here again the inner city and interstitial areas have increases in the proportion of the occupied dwelling units that are occupied by Blacks and, as of 1970, have larger percentages of their population consisting of Blacks than do other areas. Both of the transition areas have also had an increase in the proportion of dwelling units occupied by Blacks. Grid Area 20 is not an anomaly since it is adjacent to Grid Area 16. With only one exception, these are also the areas with the highest percent of female headed households.

Turning to the data on mean number of occupied dwelling units and mean number of persons in the block, we find decreasing or stable densities in the inner city and interstitial areas. All outlying areas are characterized by increases in dwelling unit and population densities between 1960 and 1980. A word of caution should be issued, however, because many of the outlying blocks are much larger than regular city blocks, thus containing more houses with less real density of dwelling units or population. Added to this is the growth of apartment houses and other forms of multiple dwelling units on the periphery of the city. But the fact remains that these are the areas in which growth has taken place.

Natural area block demographics are presented in Table 7. The outline of the smaller natural areas is such that the two inner city areas have relatively high proportions of their housing units occupied by Blacks and relatively high proportions of their populations Black. Three of the interstitial areas are shown to be becoming similar to the inner city areas in these respects. The same pattern is found for female heads of households.

While not all of the inner city and interstitial areas, as delineated, are stable or declining in housing and population density, housing and population density is increasing in the peripheral areas and in most stable residential areas. Comparisons of trends by natural area in respect to population and housing must, however, be made with some care because the boundaries of natural areas were changed slightly between 1960 and 1970 in order to maximize the homogeneity of these areas and take into consideration the expansion of the inner city and interstitial areas.

Although, as had been indicated, there are some problems in characterizing tracts, grids, and natural areas by housing and population density because not all census blocks are of the same size, particularly in peripheral areas, these data do enable us to more precisely characterize areas than was possible in previous reports on the development of the ecology of Racine.

APPENDIX C

DEVELOPMENT OF LAND USE INDICES

Tables 1, 2, and 3 show land use by census tracts, police grid areas, and natural areas and changes from 1950 to 1970. Primary, secondary, and tertiary land uses for all blocks were coded according to the following eight categories: 1) residential, 2) business-commercial, 3) schools, 4) parks-playgrounds, 5) cemeteries, 6) institutions (hospitals, government offices, courthouses, etc.), 7) manufacturing-industrial, and 8) vacant. Inspection of the distribution of land uses indicated that collapsing of categories would make it easier to compare areas. Cemeteries were collapsed with parks-playgrounds. Business-commercial and institutional uses were also collapsed.

In order to determine the general pattern of usage for each census tract, police grid area, or natural area the first use of each block was weighted 3, the second use 2, and the third 1, these weights being multiplied by the number of blocks which had this as a first, second, or third use. Thus, an area could have only one use or could have up to six uses.

Land use for census tracts, as presented in Table 1 by the groups of tracts to which we have referred, shows a predominance of business and manufacturing in only one tract but a very high proportion of land use for these purposes in all others. Not a single tract fails to have some blocks with business-commercial activities and some peripheral, mainly residential areas have a

TABLE 1. CLASSIFICATION OF LAND USE BY CENSUS TRACTS BASED ON THREE MOST PREDOMINANT USES OF LAND IN EACH BLOCK: 1950-1970

Inner City and Interstitial Areas*

	Tract 1	Tract 3	Tract 4	Tract 5
1950	B M P S	R M B S	R B M S P V	R B M P V S
1960	B M P R S	R M B S P	R B M P S V	R B M P S
1970	B M P R S	R M B S P	R B M P S V	R B M P S V
	80-90% Bus. Mfg.	55%+ Bus. Mfg.	45%+ Bus. Mfg.	40%+ Bus. Mfg.

Heterogeneous Transition Areas

	Tract 2	Tract 6
1950	R B S P	R B P M S V C
1960	R B S P	R B M P S C V
1970	R B S P	R B P V S C M
	Res; 20%+ Bus; Changing Educ. Use	Res; 10%+ Bus.

Older Stable Residential Areas

	Tract 7	Tract 13
1950	R V B M P S	R B P M S V
1960	R M B P S	R B P S M
1970	R M B P S	R B P M S
	Res; Mfg. Bus. Inc. to 20%	Res; Mfg. Bus. 20%+

Southwestern Fringe Areas

	Tract 8	Tract 9	Tract 10
1950	V P R	R M P V B	R B V M S
1960	R P B V S	R B M P V S	R B M S P V
1970	R P B S	R B M P S	R B M S P V
	Developing Res.	Developing Res; Bus. Mfg. Dec. 33% to 21%	Developing Res./Bus.

Northwestern Fringe Areas

	Tract 11	Tract 12	Tract 14
1950	R V P B S C	R M B V P S	R V B
1960	R B P S C V	R M B V P S	R B M V P
1970	R B S P	R B M P S V	R B M P S
	Developing Res.	Developing Res; Bus. Dec. 35% to 23%	Developing Res.

* R = Residential; B = Business-Commercial-Institutional; S = Schools; P = Parks-Playgrounds; C = Cemeteries; M = Manufacturing-Industrial; V = Vacant. Each block's 3 principal uses were coded and the first use of each block weighted 3, the second use 2, and the third 1. The sum total of each category of land use was determined by multiplying the number of blocks in which this was a principal, secondary, or tentiary use by the appropriate weights and adding these products. These simple

weights are the basis for the rank ordering of land use in 1950, 1960, and 1970 for each census tract. They are also permit characterization of a tract as having a given percent of the land devoted to residential vs. business and manufacturing use. If R is underlined, roughly 60% or more of the blocks in the census tracts were utilized for residential purposes.

TABLE 2. CLASSIFICATION OF LAND USE BY POLICE GRID AREAS BASED ON THREE MOST PREDOMINANT USES OF LAND IN EACH BLOCK: 1950-1970

Inner City and Interstitial Areas

	Grid Area 8	Grid Area 12	Grid Area 13	Grid Area 16
1950	$\underline{R}$ B M S P V	R B M P S	$\underline{R}$ B M P V C S	$\underline{R}$ B M S
1960	$\underline{R}$ B M P S V	R B M P S	$\underline{R}$ B P M S C V	$\underline{R}$ B M S P
1970	$\underline{R}$ B P S M V	R B M P S	$\underline{R}$ B P M S C	R B M S P
	60%+ Res; Dec. Mfg.	50-60% Bus. Mfg.	60%+ Res; 25-30% Bus. Mfg.	Dec. Res; 35% Bus. Mfg.

Partially in Transition Areas

	Grid Area 9	Grid Area 17
1950	$\underline{R}$ B M V P S	$\underline{R}$ B M S
1960	$\underline{R}$ B M P V S	R M B S P
1970	$\underline{R}$ B M P V S	$\underline{R}$ B M V S P
	60%+ Res; 30% Bus. Mfg.	30%+ Bus. Mfg.

Stable Residential Areas

	Grid Area 4	Grid Area 14	Grid Area 18	Grid Area 21
1950	$\underline{R}$ V B P S	$\underline{R}$ V B C P S	$\underline{R}$ B M V S	$\underline{R}$ V B P S
1960	$\underline{R}$ B P S	$\underline{R}$ B V P C S	$\underline{R}$ B M S P	$\underline{R}$ B P S V
1970	$\underline{R}$ B P S	$\underline{R}$ B S P C	$\underline{R}$ B M P V S	$\underline{R}$ B P S
	Stable High Res.	Stable High Res.	Stable High Res; Bus. Mfg. Dec.	Stable High Res.

Peripheral High Target or Recently Developing Areas

	Grid Area 5	Grid Area 6	Grid Area 15	Grid Area 22	Grid Area 20
1950	$\underline{R}$ B M V P	--	--	$\underline{R}$ M P B V	R P B
1960	$\underline{R}$ B M V P	$\underline{R}$ M B	$\underline{R}$ B	$\underline{R}$ B P M V S	R P S B
1970	$\underline{R}$ B M P	R B M	$\underline{R}$ B	$\underline{R}$ B M P S	$\underline{R}$ P S B
	20%+ Bus. Mfg	50% Bus. Mfg.	Developing Res.	Developing High Res; 20%- Bus. Mfg.	Developing Res.

Suburban Residential

	Grid Area 1	Grid Area 2	Grid Area 10	Grid Area 19	Grid Area 23
1950	$\underline{R}$ V B	$\underline{R}$ B	$\underline{P}$ R	--	--
1960	$\underline{R}$ B V	$\underline{R}$ M V B	$\underline{R}$ V P B S	V S	--
1970	$\underline{R}$ B S	$\underline{R}$ M B	$\underline{R}$ P B S	$\underline{R}$ B M S	$\underline{R}$
	High Res.	High Res.	High Res.	Developing Res. 20%+ Bus. Mfg.	Developing Res.

* R = Residential; B = Business-Commercial-Institutional; S = Schools; P = Parks - Playgrounds; C = Cemeteries; M = Manufacturing-Industrial; V = Vacant. Each block's 3 principal uses were coded and the first use of each block weighted 3, the second use 2, and the third 1. The sum total of each category of land use was determined by multiplying the number of blocks in which this was a principal, secondary, or tertiary use by the appropriate weights and adding these products.

TABLE 3. CLASSIFICATION OF LAND USE BY NATURAL AREAS BASED ON THREE MOST PREDOMINANT USES OF LAND IN EACH BLOCK: 1950-70

Inner City

	Natural Area 1	Natural Area 2
1950	R M B P V S	M B R V S
1960	R M B P S	M R B P S
1970	R B M P V S	R M B P S
	50%± Mfg. Bus.	60%+ Mfg. Bus.

Interstitial Areas

	Natural Area 3	Natural Area 4	Natural Area 5	Natural Area 6	Natural Area 7	Natural Area 8
1950	R M B S	$\underline{\text{R}}$ B S M V P	R B P S M	R B S P	--	R M V S
1960	R B M P S	$\underline{\text{R}}$ B S P M V	$\underline{\text{R}}$ B P S M	R B S P	--	$\underline{\text{R}}$ M B S V
1970	R B M S P	$\underline{\text{R}}$ B S M P V	$\underline{\text{R}}$ B S P M	$\underline{\text{R}}$ B S P	$\underline{\text{R}}$	$\underline{\text{R}}$ B M V
	35%+ Bus. Mfg.	60% Res; 25% Bus. Mfg.	60% Res; 25%+ Bus. Mfg.	Inc. Res; 20% Bus.	Developing Res.	Mfg. Bus. Dec. from 34% to 12%

Stable Residential

	Natural Area 9	Natural Area 10	Natural Area 11	Natural Area 12	Natural Area 13	Natural Area 14
1950	R M V B P S	$\underline{\text{R}}$ M B S	$\underline{\text{R}}$ B S P	R M B V P S	$\underline{\text{R}}$ B V P M S	R P B V M S
1960	R M B V P S	$\underline{\text{R}}$ M B S P	$\underline{\text{R}}$ B S P	R M B V S P	$\underline{\text{R}}$ B M P S	$\underline{\text{R}}$ P B C S V M
1970	R P B M S	$\underline{\text{R}}$ M B V S P	$\underline{\text{R}}$ B V S P	$\underline{\text{R}}$ B M S P	$\underline{\text{R}}$ B P M S	$\underline{\text{R}}$ P B C S
	Declining Mfg. Bus. but 20%+.	Res; 30%+ Mfg. Bus.	Res; 20% Bus.	Res; 25% Bus. Mfg.	Res; 20% Bus. Mfg.	Stable Res.

Peripheral Middle Class Residential

	Natural Area 15	Natural Area 16	Natural Area 17	Natural Area 18	Natural Area 19	Natural Area 20
1950	--	$\underline{\text{R}}$ B V	R V B P S	$\underline{\text{R}}$ V B	R M P V B	$\underline{\text{R}}$ V C P S B
1960	--	$\underline{\text{R}}$ B P	$\underline{\text{R}}$ B P S V	$\underline{\text{R}}$ B M V P	$\underline{\text{R}}$ B P M V S	$\underline{\text{R}}$ V B C P S
1970	$\underline{\text{R}}$ P S	$\underline{\text{R}}$ B P	$\underline{\text{R}}$ B P S	$\underline{\text{R}}$ B M P S	$\underline{\text{R}}$ B M P S	$\underline{\text{R}}$ B S P
	Residential	Stable Res.	Residential	Stable Res.	Residential 20%± Bus. Mfg.	Residential

Upper Class Residential

	Natural Area 21	Natural Area 22	Natural Area 23	Natural Area 24	Natural Area 25	Natural Area 26
1950	$\underline{\text{R}}$ P B	--	--	--	$\underline{\text{R}}$ V B	--
1960	$\underline{\text{R}}$ P B	--	--	--	$\underline{\text{R}}$ B P	--
1970	$\underline{\text{R}}$ P B	$\underline{\text{R}}$ B M S	$\underline{\text{R}}$ C P	$\underline{\text{R}}$ B	$\underline{\text{R}}$ B P	$\underline{\text{R}}$ B M
	Residential	Developing Res; 20%-	Residential	Residential	Residential	Residential

sizeable land use in this category. On the other hand, every tract outside of the inner city had circa 60% or more of its land utilized for residential dwelling by 1970. The existence of parks-playgrounds and schools in every tract by 1970 and most tracts in 1960 provided each with a setting for one form of delinquent behavior or another in addition to that provided by business-commercial establishments.

Turning to Table 2, we find the land use which characterizes police grid areas. Inner city and interstitial areas have more space devoted to residential buildings than any other single use but a combination of business-commercial and manufacturing use is high in these areas and in the transition areas in comparison to that found for stable residential areas and most peripheral or suburban residential areas. This is consistent with the classical model of urban ecology. Since these are relatively small areas, some have neither parks-playgrounds nor schools as arenas for delinquent behavior. All except one area has some business-commercial land use. Others are almost entirely devoted to residential land use and residential use is becoming even more predominant as vacant areas are developed into residential areas.

Extremes in land use differences are shown even better in Table 3 where data for natural areas are presented. While the inner city areas are heavily business-commercial and manufacturing, only two of the peripheral middle or upper class residential areas have sizeable proportions of their blocks devoted to this use. Twelve of the 26 natural areas had 20% or more of their land devoted to business-commercial and/or manufacturing in 1970 so that it will be interesting to see if this alone differentiates high delinquency and crime areas from low delinquency and crime areas or those which have increasing rates of delinquency and crime in more recent years.

Before proceeding further we thought it advisable to look at each kind of area in terms of a simple land use index based on the percent of land devoted to business-commercial and manufacturing-industrial usage.

The results are shown in Table 4, arranged according to the grouping for census tracts to the degree that this is possible. It is apparent that within each grouping of areas there is a wide range in the proportion of the land utilized for business-commercial and manufacturing-industrial purposes. Variation in the size of blocks in some peripheral areas is a problem but this does give us one additional measure of land use.

Although the approach just described enabled us to present changes in land use over time in terms of the various spatial systems that have been used for manipulation of the data, with the exception of percent commercial-industrial or some similar percentage we did not have a metric measure that could be used in regression or similar types of analyses.

The second section of this appendix describes the application of canonical correlation analysis to the construction of land use scores for blocks.[1] Although three levels of land use were coded (primary, secondary, and tertiary), there was little

TABLE 4. PERCENT OF EACH AREA DEVOTED TO BUSINESS-COMMERCIAL AND MANUFACTURING-INDUSTRIAL USE: 1950-1970.

	Census Tracts				Police Grid Areas				Natural Areas		
	1950	1960	1970		1950	1960	1970		1950	1960	1970
Inner City and Interstitial Areas:											
1	90.0	85.1	78.2	8	28.8	29.3	24.4	1	52.1	62.6	45.9
3	57.8	57.3	56.1	12	58.1	54.2	56.3	2	70.7	64.5	60.7
4	49.7	55.7	45.0	13	26.8	26.5	29.0				
5	36.7	42.5	39.7	16	36.4	36.3	34.0				
Heterogeneous Transition Areas:											
2	18.9	23.2	20.8	9	35.4	28.3	29.9	3	41.5	38.5	36.6
6	12.6	13.7	12.6	17	33.3	43.0	32.2	4	24.9	25.5	24.4
								5	34.5	27.9	26.7
								6	21.2	21.6	21.2
								8	34.0	19.9	12.0
Older Stable Residential Areas:											
7	16.8	17.3	19.6	4	7.8	8.0	8.2	9	28.9	23.1	21.9
13	20.6	19.6	22.2	14	8.0	8.1	9.1	10	30.0	30.5	31.6
				18	22.6	19.3	14.5	11	19.1	19.5	19.3
				21	5.6	5.1	6.7	13	16.2	20.4	20.5
								14	11.6	8.2	12.2
								21	1.6	2.1	2.0
Southwestern Fringe Areas:											
8	.0	6.7	6.0	19	--	33.3	23.0	16	21.5	12.7	13.8
9	32.8	25.0	21.4	20	4.0	7.1	7.1	17	6.1	5.7	6.9
10	18.9	13.1	12.5	22	22.3	15.9	18.6	19	22.7	19.2	19.6
				23	--	--	--	22	--	--	17.9
								24	--	--	14.3
								26	--	--	33.3
								7	--	--	.0
Northwestern Fringe Areas:											
11	2.9	3.9	7.2	1	25.0	9.1	12.3	20	1.3	5.9	7.2
12	35.0	26.9	22.7	2	.0	23.7	12.5	23	--	--	.0
14	1.1	12.0	12.0	5	27.0	28.6	22.8	12	37.7	25.4	25.1
				6	--	36.6	50.0	18	13.7	14.3	14.3
				10	.0	7.5	8.5	25	5.6	6.1	5.3
				15	--	16.0	14.3				

variation in tertiary land use so this level was ignored in the development of the land use scores. If a block had only one use, that use was coded for both primary and secondary uses. For example, if all of the block was used for residential purposes, primary and secondary uses were coded as residential for that block.

The distribution of blocks for primary and secondary land use in each census year is presented in Table 5. In each year, a majority of blocks are devoted to residential use and this holds true for both primary and secondary land use. It is also apparent that the proportion of blocks which are devoted to residential use has been increasing over time. For example, the percent of blocks devoted to primary land use increased from 66.3% in 1950 to 78.2% in 1970. Since the addition of new blocks occurred primarily in the suburban fringes, this change is not surprising.

Table 5 also indicates that some categories of land use contain very few blocks. In every census year, for example, less than 1% of the blocks have a primary use as cemeteries. We therefore collapsed the original categories to form four new categories: 1) residential, 2) business, commercial, or institutional, 3) unsupervised spaces (schools, parks, playgrounds, cemeteries, or vacant spaces), and 4) manufacturing and industrial. This revised coding scheme creates a degree of homogeneity within categories while maintaining distinctions in land use which may have some relevance for the analysis of crime.

TABLE 5. DISTRIBUTION OF PRIMARY AND SECONDARY LAND USE BY CENSUS YEAR BY PERCENT

	1950		1960		1970	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Residential	66.3	52.7	75.6	62.7	78.2	65.6
Business-Commercial	9.7	20.8	8.0	19.4	9.0	20.4
Schools	.3	2.3	.6	2.4	.2	2.6
Parks-Playgrounds	2.7	3.2	2.8	3.2	3.3	3.3
Cemeteries	.3	.3	.3	.1	.2	.0
Institutions	.1	2.2	.1	1.3	.2	1.4
Manufacturing-Industrial	14.0	11.9	10.6	8.9	8.2	6.0
Vacant	6.6	6.6	1.9	1.9	.7	0.7
Total	100.0	100.0	99.9	99.9	100.0	100.0
N	1055		1207		1214	

Table 6 presents the distribution of individual blocks in each census year for the four revised categories of primary and secondary land use. At this point, however, one notices that secondary land use has a somewhat more heterogeneous distribution than does primary land use. In each census year about 20% of the blocks have a secondary use for business-commercial purposes and this proportion is relatively stable over time.

Table 7 presents a crosstabulation of primary by secondary land use for each census year. It should be emphasized that the blocks which fall into a given category in one year do not necessarily fall into the same category in a later census year. Rather, the table shows the relationship between primary and secondary land use only for a given census year.

While blocks which are used primarily for residential purposes tend to have a secondary use for residential purposes and this relationship appears to be fairly stable over time, blocks used primarily for business or commercial purposes tend to be somewhat more diversified with a predominance of secondary use for residential purposes. By 1970, 50.5% of such blocks had a secondary residential use. Blocks which consist primarily of "unsupervised" spaces showed a strong tendency to have the same secondary use in 1950 but about a quarter of such blocks were used secondarily for residential purposes in 1970. This reflects the fact that vacant blocks were being built up with residential units. Finally, blocks devoted primarily to manufacturing-industrial purposes tended to have the same secondary purpose in

TABLE 6. DISTRIBUTION OF COLLAPSED TYPES OF PRIMARY AND SECONDARY LAND USE BY CENSUS YEAR BY PERCENT

	1950		1960		1970	
	Primary	Secondary	Primary	Secondary	Primary	Secondary
Residential	66.3	52.7	75.6	62.7	78.2	65.6
Business-Commercial	9.8	22.9	8.1	20.7	9.1	21.8
Unsupervised Spaces	10.0	12.4	5.6	7.6	4.4	6.6
Manufacturing-Industrial	14.0	11.9	10.6	8.9	8.2	6.0
Total	100.1	99.9	99.9	99.9	99.9	100.0
N	1055		1207		1214	

TABLE 7. CROSSTABULATION OF PRIMARY AND SECONDARY LAND USE BY CENSUS YEAR

	Primary Land Use			
Secondary Land Use	Residential	Business-Commercial	Unsupervised Spaces	Manufacturing-Industrial
		1950 Whole Blocks		
Residential	69.4	33.0	9.5	18.2
Business-Commercial	23.0	61.2	1.0	11.5
Unsupervised Spaces	5.3	1.0	88.6	.0
Manufacturing-Industrial	2.3	4.9	1.0	70.3
Total	100.0	100.1	100.1	100.0
N	699	103	105	148
		1960 Whole Blocks		
Residential	72.4	50.0	23.5	24.2
Business-Commercial	20.9	39.8	4.4	13.3
Unsupervised Spaces	4.3	3.1	70.6	1.6
Manufacturing-Industrial	2.4	7.1	1.5	60.9
Total	100.0	100.0	100.0	100.0
N	913	98	68	128
		1970 Whole Blocks		
Residential	73.0	50.5	25.9	33.0
Business-Commercial	21.0	43.2	7.4	14.0
Unsupervised Spaces	4.2	1.8	64.8	3.0
Manufacturing-Industrial	1.8	4.5	1.9	50.0
Total	100.0	100.0	100.0	100.0
N	949	111	54	100

1950 but a third of such blocks had a secondary residential use in 1970.

The general conclusion is that while primary and secondary use for residential purposes has remained rather closely connected over time, other types of blocks show a trend toward greater diversification. Specifically, there is some indication that a secondary use of blocks for residential purposes has become more common among blocks used for other purposes. While we suspect that one of the factors contributing to this pattern of change is the erection of residential units on vacant spaces, the changes for blocks devoted primarily to manufacturing-industrial purposes are not so easily interpreted.

The data presented so far suggest that it will be useful to take into account both primary and secondary land uses. Furthermore, since it is our goal to develop a summary measure of land use, the apparent association between primary and secondary land use suggests a basis for scaling one in terms of the other. That is, in the absence of a theoretical basis for ordering land use categories, it is possible to obtain an empirically based land use scale. A method for obtaining such a scale based on two sets of variables is canonical analysis.[2]

The input to canonical analysis is the matrix of zero-order correlations among two distinct sets of variables. It is assumed that the variables are interval-level. The data consist of two sets of dummy variables (one each for primary and secondary land use) which satisfy this condition.

Canonical analysis derives a linear combination from each set of variables such that the correlation between the two linear combinations is maximized. These "canonical variates" are designed to account for as much of the relationship between the two sets of variables as possible. Successive pairs of canonical variates are then derived so as to account for as much as possible of the relationship between the two sets of variables which is not accounted for by the previous variates. Thus, the sets of canonical variates are statistically independent of each other. Canonical analysis may also be used to generate scores for each case which reflect its position relative to other cases in terms of the canonical variate. This procedure is similar to deriving factor scores from a factor analytic study.

The meaning of the canonical variates, as in factor analysis, must be determined by the researcher. The meaning of the variates in our analysis will depend on their pattern of relationships to the land use dummy variables which measure specific types of land use. In short, the goal of this analysis is to develop composite measures of land use from canonical analysis in which primary land use is scaled in terms of secondary land use and vice versa.

The SPSS package was used to obtain the canonical variates and output estimated canonical scores for each block.[3] The analysis was performed for census blocks for each census year as well as equivalent "spaces" across census years. Since the results were similar for both types of spaces, only those results based on the individual blocks for each census year are reported.

The results of the canonical correlation analyses of the land use dummy variables for each census year are presented in Table 8. For each analysis, we omitted the dummy variable for residential land use to permit inversion of the correlation matrix. The coefficients presented in Table 8 are the zero-order correlations between the land use dummy variables and the composite land use score obtained from the canonical correlation analysis. Following the recommendation of Levine we use these coefficients to interpret the substantive meaning of the composite scores. Table 8 also presents the canonical correlations between the canonical variates in each set.

The canonical correlations yield two types of information. First, they show the strength of the relationship between the linear composites derived from the land use dummy variables. For each year, we find that the correlation between the canonical variates in the first two sets is substantial. However, we also find that the correlation declines in strength from 1950 to 1970 which is consistent with our previous findings that the connection between primary and secondary land use has declined in strength over time. Second, the squared canonical correlation may be interpreted as the proportion of variance in one set of variables explained by the other set. For the first set of variates for the 1950 blocks, for example, we may say that primary land use explains 61.3% ($.783^2 = .613$) of the variance in secondary land use. The decline of the canonical correlations implies, therefore, a decline in the variance explained between

TABLE 8. RESULTS OF CANONICAL CORRELATION ANALYSIS OF LAND USE IN RACINE, WISCONSIN: 1950, 1960, AND 1970.

Land Use Dummy Variables	Canonical Variates					
	Set I		Set II		Set III	
Primary Use	(1950 Whole Blocks N = 1055)					
Residential	.104	.081	.779	.550	.619	.168
Business	.109	.085	.172	.121	-.979	-.266
Open	-.902	-.706	-.428	-.302	-.063	-.017
Manufacturing	.543	.425	-.838	-.592	.049	.013
Secondary Use						
Residential	.107	.137	.415	.587	.217	.798
Business	.119	.152	.193	.274	-.258	-.950
Open	-.716	-.915	-.283	-.401	-.013	-.046
Manfacturing	.409	.523	-.601	-.851	.014	.050
Canonical Correlation (R_c)	.783		.706		.272	
Primary Use	(1960 Whole Bocks N = 1207)					
Residential	.500	.318	.639	.366	.584	.077
Business	-.012	-.007	.099	.057	-.995	-.132
Open	.360	.229	-.933	-.533	-.024	-.003
Manufacturing	-.956	-.608	-.281	-.160	.086	.011
Secondary Use						
Residential	.211	.332	.291	.509	.105	.794
Business	.020	.032	.117	.204	-.129	-.979
Open	.238	.374	-.530	-.927	-.004	-.031
Manufacturing	-.607	-.954	-.166	-.290	.010	.072
Canonical Correlation (R_c)	.636		.572		.132	
Primary Use	(1970 Whole Blocks N = 1214)					
Residential	.566	.315	.506	.249	.652	.093
Business	.003	.002	.112	.067	-.995	-.156
Open	.182	.101	-.978	-.494	-.031	-.002
Manufacturing	-.990	-.551	-.144	-.073	.088	.026
Secondary Use						
Residential	.192	.354	.218	.425	.122	.826
Business	.034	.048	.090	.181	-.157	-.986
Open	.105	.191	-.494	-.978	.011	-.014
Manufacturing	-.552	-.990	-.077	-.143	.016	.077
Canonical Correlation (R_c)	.565		.519		.171	

Note. - The canonical variates are scaled to have a mean of zero and a standard deviation of one. The coefficients are the zero-order correlations between the land use dummy variables and the composite land use score obtained from the canonical correlation analysis. All canonical correlations are significant at the .05 level.

the canonical variates. In 1970, for example, primary land use explains only 31.9% of the variance in secondary land use for the first set of variates.[4]

It is also clear that the third set of variates derived from the analysis for each year is substantially trivial. Thus, although all of the canonical correlations are statistically significant, the small magnitudes of those for the third pair of variates for each year suggest that the relationship is not very important. Another way to interpret this result is in a manner similar to that of "minor factors" derived from a factor analysis.

Although the magnitude of the canonical correlations for the first and second sets of variates suggests that the analysis has yielded useful results, our interest lies in the substantive meaning of the estimated composite land use scores. The correlations between the land use dummy variables and the composite scores permits us to interpret the meaning of these scores.[5] To help visualize this procedure, we have blocked off the correlations between the land use dummy variables and the relevant composite. For example, the first column of correlations listed under Set I represents the correlations between the 1950 primary land use dummies and the composite score derived from their intercorrelations in the canonical analysis. Thus, these correlations should be higher than those for the same set of variables with the second composite score. However, they will also be correlated with the second composite due to the canonical correlation.

The first set of canonical variates for the 1950 blocks represents the distinction between manufacturing and "open spaces." Blocks with a primary use of open space will have a low score on this composite and blocks with a primary use for manufacturing will have a high score. The second set of composites reflects the distinction between residential and manufacturing uses. For example, the strongest positive correlation with the first composite in this set is with the dummy variable for residential primary land use (r = .779) and the strongest negative correlation is with the dummy variable for primary manufacturing use (r = .838). These results show that this particular composite maximally distinguishes between residential and manufacturing land use and that blocks which are devoted primarily to residential land use will have a high score on this composite while those devoted primarily to manufacturing will have a low score.[6] The second composite in Set II for the 1950 blocks bears the same interpretation since the composites are derived as pairs. However, the second composite is a measure of secondary land use.

The third set of composites reflects a distinction between residential and business-commercial uses. As we have already noted, however, the magnitude of the canonical correlation suggests that the substantive importance of this distinction may not be too great.

The results for 1960 and 1970 blocks are very similar to those for the 1950 blocks with two minor exceptions. First, the correlations between the land use dummy variables and the second composite in Set I for the 1960 blocks do not yield an unambiguous interpretation. While the first composite apparently measures the residential-manufacturing distinction, the correlation with the dummy for secondary land use as open spaces on the second composite is marginally higher than that of residential use (i.e., .374 vs. .332). This is not a problem since we will focus chiefly on primary land use and the results otherwise are rather clear. Second, we should note that the residential vs. manufacturing distinction does not always appear as the first set of composites. Given the similar magnitudes of the canonical correlations, however, this does not appear to reflect an important variation in the data.

Tables 9, 10, and 11 present mean land use scores for census tracts, police grid areas, and natural areas, respectively. The land use scores used in these tables are those which measure the distinction between residential and manufacturing land use. Because we believe this distinction to be the most relevant one for the analysis of crime, these scores will be used in subsequent analyses.

The data are presented to show how the areas of the city can be described in terms of land use by using an intuitively appealing composite score which is nevertheless statistically sophisticated. Our discussion focuses on the results for census tracts in Table 9 since similar inferences may be drawn from the results for police grid areas and natural areas.

TABLE 9. MEAN PRIMARY AND SECONDARY LAND USE SCORES FOR CENSUS TRACTS BY YEAR OF CENSUS

	Primary Land Use						Secondary Land Use					
	1950		1960		1970		1950		1960		1970	
Census Tract	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N
1	-.375	33	-.430	21	-.376	28	-.445	33	.011	21	-.257	28
2	.510	85	.296	80	.268	80	.312	85	.307	80	.240	80
3	-.705	100	-1.032	87	-1.305	80	-.611	100	-.821	87	-.976	80
4	-.208	102	-.502	95	-.455	85	-.272	102	-.473	95	-.548	85
5	.037	93	-.090	96	-.254	89	-.011	93	-.117	96	-.306	89
6	.263	75	.267	72	.333	75	.174	75	.128	72	.132	75
7	-.033	99	-.035	98	-.153	102	.068	99	.033	98	.031	102
8	-1.082	18	.482	18	.304	25	-.885	18	.524	18	.304	25
9	-.330	41	-.058	88	.082	92	-.374	41	-.052	88	.137	92
10	.399	89	.252	133	.250	142	.334	89	.184	133	.167	142
11	.078	48	.435	74	.288	79	.146	48	.418	74	.246	79
12	-.383	78	-.149	115	-.138	99	-.185	78	-.115	115	-.011	99
13	.420	129	.262	128	.187	128	.422	129	.210	128	.149	128
14	.158	65	.282	100	.241	102	.198	65	.149	100	.139	102

NOTE: N is the number of blocks in the census tract.

TABLE 10. MEAN PRIMARY AND SECONDARY LAND USE SCORES BY POLICE GRIDS BY YEAR OF CENSUS

	Primary Land Use						Secondary Land Use					
	1950		1960		1970		1950		1960		1970	
Police Grid	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N
1	-.365	2	.343	20	.263	33	-.564	2	.279	20	.235	33
2	.556	1	.114	11	-.092	10	.502	1	-.267	11	-.191	10
4	.208	85	.325	87	.301	84	.264	85	.243	87	.224	84
5	.111	60	-.102	79	-.067	68	.252	60	-.080	79	.074	68
6	--	0	-.153	7	-.526	5	--	0	-.271	7	.104	5
8	.216	97	.030	99	.105	91	.172	97	.182	99	.108	91
9	-.092	98	-.088	107	-.104	107	.010	98	-.225	107	-.260	107
10	-.058	3	.759	15	.368	13	-1.066	3	.787	15	.288	13
12	-.347	131	-.532	101	-.536	98	-.378	131	-.327	101	-.263	98
13	.069	110	.203	111	-.041	108	-.071	110	-.059	111	-.128	108
14	.209	64	.399	77	.281	75	.221	64	.355	77	.246	75
15	--	0	.284	7	.281	16	--	0	.200	7	.198	16
16	.163	88	-.117	86	-.193	84	.088	88	-.058	86	-.195	84
17	-.266	121	-.651	117	-.663	117	-.112	121	-.456	117	-.587	117
18	.205	92	.074	147	.164	138	.063	92	.005	147	.134	138
19	--	0	.056	3	.254	11	--	0	-.148	3	-.139	11
20	-.058	6	.680	3	.469	3	-.255	6	1.300	3	.721	3
21	-.109	75	.330	76	.287	86	-.118	75	.348	76	.259	86
22	-.175	22	.267	54	.186	59	.069	22	.319	54	.243	59
23	--	0	--	0	.281	8	--	0	--	0	.198	8

NOTE: N is the number of blocks in the police grid.

TABLE 11. MEAN PRIMARY AND SECONDARY LAND USE SCORES BY NATURAL AREA BY YEAR OF CENSUS

	Primary Land Use						Secondary Land Use					
	1950		1960		1970		1950		1960		1970	
Natural Area	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N	$\bar{X}$	N
1	-.401	96	-.533	91	-.449	94	-.409	96	-.650	91	-.624	94
2	-.662	130	-1.034	110	-1.133	117	-.633	130	-.714	110	-.783	117
3	-.060	33	-.351	31	.033	28	-.032	33	-.378	31	-.130	28
4	.500	89	.263	88	.161	83	.361	89	.280	88	.146	83
5	.384	77	.167	72	.157	64	.246	77	.273	72	.095	64
6	.394	23	.373	23	.293	23	.253	23	.407	23	.278	23
7	--	0	--	0	.281	4	--	0	--	0	.241	4
8	-.273	33	-.089	81	.111	73	-.460	33	-.135	81	.179	73
9	-.360	44	-.036	42	-.023	39	-.205	44	-.197	42	-.184	39
10	.013	63	-.329	63	-.590	63	.156	63	-.258	63	-.457	63
11	.455	38	.313	37	.320	42	.499	38	.232	37	.253	42
12	-.387	33	-.244	71	-.250	58	-.085	33	-.108	71	.085	58
13	.280	73	.237	75	.230	64	.395	73	.144	75	.130	64
14	.136	44	.505	43	.413	43	-.071	44	.314	43	.324	43
16	.420	42	.300	53	.287	48	.425	42	.239	53	.215	48
17	-.188	67	.336	68	.288	74	-.198	67	.343	68	.264	74
18	.280	27	.287	57	.221	68	.300	27	.146	57	.162	68
19	-.129	30	.216	58	.128	61	-.046	30	.197	58	.101	61
20	.146	54	.455	83	.281	80	.164	54	.401	83	.240	80
21	.556	18	.284	15	.281	15	.376	18	.325	15	.305	15
22	--	0	--	0	.254	11	--	0	--	0	-.139	11
23	--	0	--	0	.344	9	--	0	--	0	.294	9
24	--	0	--	0	.281	8	--	0	--	0	.198	8
25	.240	41	.310	45	.294	43	.275	41	.243	45	.229	43
26	--	0	--	0	.281	2	--	0	--	0	.155	2

NOTE: N is the number of blocks in the natural area.

One of the more important findings in Table 9 is that while there is some correspondence between land use and the location of the tract in the inner city, this is not always the case. For example, Tract 1 (an inner city tract) had a relatively low mean land use score in 1950, indicating that it ranked relatively low in terms of residential land use. However, Tract 8 had the lowest mean score of all tracts in 1950. An inspection of detailed breakdowns of land use (not shown here) showed that Tract 8 was predominantly vacant in 1950 and subsequently was built up with residential units. Thus, even though the land use score distinguishes between residential and manufacturing land use, there may be specific instances when this interpretation does not hold.

An examination of changes in mean land use scores reveals some of the aspects of change in different areas of the city. Certain tracts evidence a clear pattern of a shift away from residential toward manufacturing land use. This is seen in the inner city tracts such as Tract 4 and also in tracts which border on or include a portion of the inner city such as Tract 3. Other areas, such as Tract 8, show a pattern of increasing residential land use which is almost exclusively confined to outlying tracts (e.g., Tracts 9, 11, 12, and 14). Tracts 6 and 7 which are intermediate in distance from the inner city are rather stable in their land use patterns. In short, the cross-sectional and inter-temporal distributions of the land use score are consistent with what we would expect on the basis of the location of the tract within the city.

To further assess the validity of the land use scores, we have computed correlations between the mean land use scores and selected tract characteristics for each census year and these are presented in Table 12. In 1950 the relationship between land use and other characteristics is modest at best, the largest correlation being that between land use and percent units Black-occupied (r = .338). Indeed, there appears to be no relationship between land use and mean number of targets or the factor score (which reflects housing quality) in 1950. However, it is apparent that this picture changed markedly by 1960 when we find strong correlations between land use and percent units Black-occupied as well as the factor score. In addition, land use is moderately correlated with targets and percent commercial-industrial by 1960, while the correlation with residential vacancies remained stable. The picture, then, is one of increasing differentiation among the census tracts, particularly in terms of racial segregation and housing quality which are, of course, linked with each other (r = -.583). Another indication of the changing nature of land use between 1950 and 1960 is the relatively modest correlation (r = .421) between land use for the two census years.

The results for 1970 suggest a stabilization of the relationship between land use and other characteristics during the 1960-1970 decade. The correlations between land use and census tract characteristics in 1970 are quite similar to those for 1960 and the correlation between 1960 and 1970 land use is quite high (r = .968).

TABLE 12. ZERO-ORDER CORRELATIONS BETWEEN LAND USE (RESIDENTIAL VS. MANUFACTURING) AND SELECTED CENSUS TRACT CHARACTERISTICS BY CENSUS YEAR

	1950	1960	1970
Log Targets	-.061	-.546	-.559
Log % Commercial-Industrial	.272	-.513	-.462
Log Residential Vacancies	-.235	-.255	-.536
Log % Units Black-occupied	-.338	-.754	-.747
Factor Score	.020	.635	.603
1950 Land Use Score	--	.421	.467
1960 Land Use Score		--	.968

Note: The correlations in each column are the correlations between the census tract's mean land use score and the respective characteristic for each census year. The number of census tracts is 14.

A further indication of the utility of the land use scores lies in the fact that they correlate in the expected direction with other census tract characteristics. For example, the 1960 and 1970 correlations show that the greater the residential land use in a census tract, the lower the percent units Black-occupied and the higher the level of housing quality. Thus, land use might be considered to be a reasonable proxy for these characteristics if a researcher has no other information on such areal characteristics. However, this is not true for targets, percent commercial-industrial, or residential vacancies, although the sign of the relationships is in the expected direction.

FOOTNOTES

[1] This application of canonical correlation analysis to the quantification of land use was conducted by Dr. James P. Curry. This description is taken from a longer paper detailing the development of these scores.

[2] For an excellent introductory description see Mark S. Levine, <u>Canonical Analysis and Factor Comparison</u>, Sage University Paper Series on Quantitative Applications in the Social Sciences, 07-006. Beverly Hills: Sage Publications, 1977.

[3] See Norman H. Nie, C. Hadlai Hull, Jean G. Jenkins, Karin Steinbrenner, and Dale H. Brent, <u>Statistical Package for the Social Sciences</u>, 2nd Edition, New York: McGraw-Hill, 1975.

[4] The canonical correlations do not provide summary measures of the overall relationship obtained by the canonical analysis. One such measure proposed in the literature is the average squared canonical correlation. For the 1950 blocks, this is

$$.395 = \frac{(.783^2 + .706^2 + .262^2)}{3}$$

(Mark I. Alpert and Robert A. Peterson, "On the Interpretation of Canonical Analysis," <u>Journal of Marketing Research</u>, Vol. 9, May 1972, pp. 187-292.) However, we prefer to focus on obtaining a composite summary index of land use. Our judgement of the usefulness of the composites rests on their correlations with the original land use dummy variables.

[5] The canonical analysis program we used does not provide statistics analogous to factor loadings which permit the

determination of the meaning of the canonical variates. While the program does provide the coefficients used in computing the composites, these coefficients may be difficult to interpret because of multicollinearity among the variables within each set. See Alpert and Peterson, 1972 and Levine, 1977.

[6] In practice, there is a limited range of unique scores which apply to the blocks for a given census year. This is due to the fact that a given block may have only one of four possible land uses. However, the scores are derived so as to constitute a hypothetical continuous distribution.

APPENDIX D

DEVELOPMENT OF TARGET DENSITIES AND CHANGE 1950-1970

This appendix describes the development of a metric measure of target density and change in target density.

Tables 1, 2, and 3 contain figures on the average number of taverns, gas stations, grocery and liquor stores, and restaurants in each block within the city limits, 1950, 1960, and 1970, separately and collectively for each tract, grid area, or natural area.

Census tracts have been arranged in five categories in Table 1 as we have characterized them from observation of land use, housing, and demographic variables. It is apparent that taverns constitute approximately one-half of the targets in the inner city and interstitial areas, considerably less or practically none in other areas. It is also clear that between 1960 and 1970 the number of targets other than taverns (with the exception of Tract 5) has been declining in the inner city and interstitial areas and the transitional areas. Note that all of these tracts are adjacent to each other and constitute one large area which, with the exception of Tract 6, has a disproportionate number of the city's taverns. Each of these tracts also has deteriorated or substandard housing. These tracts decreased in population betwen 1950 and 1970. All have high composite characteristics generative of delinquency and crime in the area and all but Tract 6 have composite characteristics which are hypothesized to be generative of delinquency and crime by residents of the area.

TABLE 1. SPECIALIZED TARGET DENSITY AND CHANGE BY BLOCKS IN CENSUS TRACTS: 1950-1970

	Mean Number Taverns			Mean Number Gas Stations			Mean Number Groc., Liquor Stores			Mean Number Restaurants			Mean Number Targets			Change in Targets			
	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950-1960	1960-1970	Major Targets	Major Type of Target Change 1950-1970
Inner City and Interstitial Areas:																			
1	.79	1.00	.61	.18	.11	.04	.27	.26	.04	.71	1.11	.43	1.94	2.47	1.11	+.53	-1.36	Tavs., Rest.	Dec. in all Targets
3	.39	.34	.28	.13	.13	.10	.26	.18	.06	.13	.12	.08	.91	.77	.51	-.14	-.26	Taverns	Dec. Tavs.,Groc.,Liq
4	.37	.36	.38	.11	.11	.07	.27	.19	.12	.13	.16	.11	.89	.82	.67	-.07	-.15	Taverns	Dec. Groc. & Liq.
5	.32	.24	.30	.14	.14	.10	.19	.18	.18	.10	.13	.14	.75	.69	.72	-.06	+.03	Taverns	Stable
Heterogeneous Transitional Areas:																			
2	.08	.08	.06	.06	.07	.05	.23	.21	.09	.05	.05	.01	.41	.40	.21	-.01	-.19	Assorted	Dec. Groc. & Liq.
6	.01	.02	.01	.03	.03	.03	.20	.19	.07	.00	.02	.01	.25	.25	.12	.00	-.13	Groc. & Liq.	Dec. Groc. & Liq.
Older Stable Residential Areas:																			
7	.04	.04	.04	.05	.05	.03	.07	.07	.06	.01	.02	.01	.18	.19	.14	+.01	-.05	Assorted	Stable
13	.12	.12	.13	.09	.11	.09	.27	.18	.09	.03	.01	.05	.52	.41	.36	-.11	-.05	Taverns	Dec. Groc. & Liq.
Southwestern Fringe Areas:																			
8	.00	.00	.04	.00	.06	.04	.00	.00	.12	.00	.00	.04	.00	.06	.24	+.06	+.18	Groc. & Liq.	Inc. Groc. & Liq.
9	.00	.05	.04	.05	.13	.13	.05	.08	.10	.00	.05	.09	.10	.30	.36	+.20	+.06	All except tav.	Inc. except taverns
10	.00	.00	.00	.09	.07	.09	.14	.09	.07	.04	.03	.05	.27	.19	.21	-.08	+.02	Gas/Groc.&Liq.	Dec. Groc. & Liq.
Northwestern Fringe Areas:																			
11	.00	.00	.00	.02	.03	.06	.09	.04	.04	.00	.00	.01	.12	.07	.11	-.05	+.04	Gas Stations	Inc. Gas Stations
12	.03	.02	.02	.04	.05	.05	.11	.06	.03	.00	.02	.02	.18	.14	.12	-.04	-.02	Assorted	Dec. Groc. & Liq.
14	.05	.03	.03	.02	.02	.05	.00	.04	.07	.00	.01	.04	.07	.10	.19	+.03	+.09	Assorted	Assorted Inc.

TABLE 2. SPECIALIZED TARGET DENSITY AND CHANGE BY BLOCKS IN POLICE GRID AREAS: 1950-1970

	Mean Number Taverns			Mean Number Gas Stations			Mean Number Groc., Liquor Stores			Mean Number Restaurants			Mean Number Targets			Change in Targets		Major Targets	Major Type of Target Change 1950-1970
	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950-1960	1960-1970		
Inner City and Interstitial Areas:																			
8	.26	.24	.26	.10	.07	.07	.35	.21	.10	.07	.07	.08	.78	.60	.51	-.18	-.09	Taverns	Dec. in Groc. & Liq.
12	.30	.36	.25	.07	.08	.04	.23	.18	.06	.24	.30	.12	.84	.91	.47	+.07	-.44	Taverns	Smallest Dec. Tavs.
13	.13	.16	.13	.10	.08	.03	.18	.15	.12	.06	.05	.06	.47	.44	.33	-.03	-.11	Tavs./Groc.&Liq.	Dec. in Gas Stations
16	.36	.30	.24	.11	.12	.10	.36	.27	.10	.08	.12	.07	.92	.80	.50	-.08	-.30	Taverns	Dec. in Groc. & Liq.
Partially in Transition Areas:																			
9	.15	.15	.13	.09	.08	.08	.18	.11	.08	.02	.02	.03	.45	.36	.31	-.09	-.05	Taverns	Dec. in Groc. & Liq.
17	.31	.22	.22	.14	.15	.11	.22	.21	.11	.13	.16	.12	.79	.74	.56	-.05	-.18	Taverns	Dec. Tavs,Groc.& Liq.
Stable Residential Areas:																			
4	.01	.01	.01	.01	.02	.01	.01	.05	.05	.01	.00	.00	.09	.08	.07	-.01	-.01	Groc.&Liq.	Low Target Density
14	.00	.00	.00	.06	.08	.13	.11	.07	.08	.02	.01	.01	.19	.16	.23	-.03	+.07	Gas/Groc.&Liq.	Inc. Gas Stations
18	.00	.01	.01	.05	.05	.05	.11	.09	.06	.02	.02	.02	.19	.17	.15	-.02	-.02	Gas/Groc.&Liq.	Dec. Groc. & Liq.
21	.01	.01	.01	.01	.03	.02	.03	.01	.05	.05	.00	.01	.05	.05	.09	.00	+.04	Groc. & Liq.	No Trend
Peripheral High Target or Recently Developing Areas:																			
5	.08	.06	.07	.08	.13	.16	.07	.06	.06	.02	.03	.07	.25	.28	.37	+.03	+.09	Gas Stations	Inc. Gas & Rest.
6	--	.00	.00	--	.00	.00	--	.00	.00	--	.00	.00	--	.00	.00	--	--	No Targets	No Targets
15	--	.00	.00	--	.00	.13	--	.00	.06	--	.00	.25	--	.00	.44	--	+.44	Gas & Rest.	Inc. Gas & Rest.
22	.00	.04	.03	.09	.17	.17	.09	.07	.10	.00	.07	.14	.18	.35	.44	+.17	+.09	All But Taverns	Inc. Gas & Rest.
20	.17*	.33*	.33	.00*	.00*	.00	.00*	.00*	.33	.00*	.00*	.00	.17*	.33*	.67	+.16	+.34	Tavs., Groc.&Liq	Inc. Tavs/Groc. & Liq.
Suburban Residential Areas																			
1	.00*	.05	.00	.00*	.00	.06	1.00*	.00	.06	.00*	.00	.00	1.00*	.05	.12	--	+.07	Not Consistent	No Trend
2	.00*	.00	.00	.00*	.00	.00	1.00*	.27	.30	.00*	.00	.10	2.00*	.27	.40	--	+.13	Groc. & Liq.	No Trend
10	.00*	.00	.00	.00*	.00	.00	.00*	.00	.00	.00*	.00	.00	.00*	.00	.00	--	--	No Targets	No Targets
19	--	.00*	.00	--	.00*	.09	--	.00*	.09	--	.00*	.00	--	.00*	.18	--	+.18	Gas/Groc.&Liq.	No Trend
23	--	--	.00	--	--	.00	--	--	.00	--	--	.00	--	--	.00	--	--	No Targets	No Targets

* Fewer than 5 blocks in city limits in Grid Area.

TABLE 3. SPECIALIZED TARGET DENSITY AND CHANGE BY BLOCKS IN NATURAL AREAS: 1950-1970

	Mean Number Taverns			Mean Number Gas Stations			Mean Number Groc., Liquor Stores			Mean Number Restaurants			Mean Number Targets			Change in Targets			
	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950	1960	1970	1950-1960	1960-1970	Major Targets	Major Type of Target Change 1950-1970
Inner City:																			
1	.33	.40	.35	.10	.10	.07	.27	.23	.19	.14	.14	.10	.83	.87	.71	+.04	-.10	Taverns	Dec. Groc. & Liq.
2	.52	.49	.42	.14	.15	.09	.22	.14	.06	.24	.24	.20	1.11	1.01	.76	-.10	-.25	Taverns, Rest.	Dec. Groc. & Liq.
Interstitial Areas:																			
3	.33	.26	.32	.17	.16	.18	.13	.23	.14	.17	.16	.14	.80	.81	.79	+.01	-.02	Tavs. & Others	Stable
4	.27	.27	.23	.16	.13	.10	.34	.21	.10	.07	.06	.08	.83	.66	.51	-.17	-.15	Taverns	Dec. Groc. & Liq.
5	.21	.18	.08	.12	.10	.06	.34	.29	.09	.16	.22	.03	.82	.79	.27	-.03	-.52	Assorted	Dec. Groc.&Liq./Rest.
6	.13	.04	.04	.04	.04	.04	.35	.30	.13	.04	.04	.04	.57	.44	.26	-.13	-.18	Groc. & Liq.	Dec. Groc. & Liq.
7	--	--	.00*	--	--	.00*	--	--	.00*	--	--	.00*	--	--	.00*	--	--	No Targets	No Trend
8	.00	.03	.03	.00	.03	.03	.00	.05	.06	.03	.01	.01	.03	.11	.12	+.08	+.01	Assorted	Inc. Groc. & Liq.
Stable Residential Areas:																			
9	.04	.05	.05	.07	.07	.05	.16	.12	.03	.00	.02	.00	.27	.26	.13	-.01	-.13	Assorted	Dec. Groc. & Liq.
10	.10	.08	.06	.11	.11	.05	.14	.11	.08	.02	.06	.02	.37	.37	.21	.00	-.16	Assorted	Dec. in all
11	.00	.00	00	.11	.11	.10	.37	.32	.14	.03	.05	.05	.50	.49	.29	-.01	-.20	Groc. & Liq.	Dec. Groc. & Liq.
12	.00	.00	.00	.00	.04	.05	.10	.01	.03	.00	.01	.03	.10	.07	.12	-.03	+.05	Assorted	No Trend
13	.07	.07	.05	.06	.11	.13	.17	.15	.08	.01	.03	.05	.31	.35	.30	+.04	-.05	Gas/Groc.&Liq.	Inc.Gas/Dec.Groc.& Liq.
14	.00	.00	.00	.00	.00	.00	.12	.09	.07	.00	.00	.00	.12	.09	.07	-.03	-.02	Groc. & Liq.	Dec. Groc. & Liq.
Peripheral Middle Class Residential Areas:																			
15	--	--	--*	--	--	--*	--	--	--*	--	--	--*	--	-	--*	--	--	No Targets	No Trend
16	.00	.00	.00	.10	.08	.08	.14	.09	.04	.02	.04	.04	.26	.21	.17	-.05	-.04	Gas/Groc.&Liq.	Dec. Groc. & Liq.
17	.02	.02	.01	.00	.02	.03	.03	.02	.04	.00	.00	.01	.05	.04	.10	-.01	+.06	Assorted	No Trend
18	.04	.04	.02	.04	.02	.06	.00	.05	.09	.00	.00	.02	.08	.11	.18	-.03	+.07	Assorted	Inc. Groc. & Liq.
19	.00	.03	.03	.07	.16	.16	.07	.07	.08	.00	.07	.13	.14	.33	.41	+.19	+.08	Gas/Restaurants	Inc.Gas/Restaurants
20	.00	.00	.00	.04	.05	.11	.06	.04	.06	.00	.00	.05	.10	.08	.23	-.02	+.15	Gas/Groc.&Liq.	Inc.Gas
Upper Class Residential Areas:																			
21	.11	.20	.13	.00	.00	.00	.06	.00	.07	.00	.00	.00	.17	.20	.20	+.03	.00	Taverns	No Trend
22	--	--	.00	--	--	.09	--	--	.09	--	--	.00	--	--	.18	--	--	Gas/Groc.&Liq.	No Trend
23	--	--	.00	--	--	.11	--	--	.00	--	--	.00	--	--	.11	--	--	Gas Stations	No Trend
24	--	--	.00	--	--	.00	--	--	.00	--	--	.00	--	--	.00	--	--	No Targets	No Targets
25	.00	.02	.02	.00	.02	.00	.03	.02	.02	.00	.00	.00	.03	.07	.05	+.04	-.02	Assorted	No Trend
26	--	--	.00*	--	--	.00*	--	--	.50*	--	--	.00*	--	--	.50*	--	--	Groc. & Liq.	No Trend

* Fewer than 5 blocks in city limits in Natural Area.

At the same time, there have been target increases in most of the fringe areas and some now have target densities which should offset their earlier low target densities.

Police grid areas have been arranged in five categories in Table 2, as we have characterized them from observation of land use, housing, and demographic variables. Again, the few inner city and interstitial and transitional grid areas have had consistently high target scores but have had declines in target density since 1950 (with one exception). All have deteriorating or substandard housing (only Grid Area 17 was judged to have had a substantial proportion of sound housing). Each of the inner city and interstitial grid areas has a declining population. Without exception these six grid areas were judged to have composition characteristics generative of delinquency and crime within the area and by the area's residents. Grid Areas 14, 5, and 22 have substantial target densities that suggest higher in-area delinquency and crime rates than previously expected. Other areas which had high target densities were those growing grid areas (15, 2, and 19) which served as new locations for commercial establishments such as gas stations, restaurants, and grocery and liquor stores. The relatively high target density of some police grid areas, areas which are smaller than census tracts, indicates that increases in delinquency and crime may be expected within them by either residents or non-residents. These target densities will, therefore, play a part in our estimates of the delinquency and crime-producing characteristics of police grid areas.

Natural areas are arranged in five groups in Table 3. This arrangement is based on earlier research in which an ecology of Racine was developed from U.S. Census Block Data. These areas are smaller than census tracts and are about the same size as police grid areas, but are relatively homogeneous because their outlines were developed from observation of the geometric and factor analytic housing scores for each block.

The decline in target density for inner city and interstitial areas is consistent with that found for tracts and grid areas but, in some cases such as that for Natural Area 5, the outline of the area which is undergoing considerable change permitted greater encapsulation of the phenomenon than would otherwise have been possible. What the natural area table suggests is that the relationship between changes in the ecology of the community and changes in delinquency and crime may be more pronounced for units that have been based on observed block characteristics than on units that have been developed for non-research purposes.

APPENDIX E

SOCIAL, DEMOGRAPHIC, LAND USE, AND HOUSING CHARACTERISTICS

Census Tracts: Table 1 summarizes a rather vast amount of data on the characteristics of census tracts. Cutting points for each of the metric continua were established so that approximately one-third of the values would be low, one-third medium, and one-third high, and in such a way as to come as close as possible to these proportions for tracts, grids, and natural areas. Although this presented a problem with some skewed variables, the relative position of each unit is shown as high, medium, and low, H, M, and L meaning the same regardless of the spatial system whose characteristics are represented. Depending on the nature of the variable, the inner city tracts are almost exclusively high or low on each continuum and the peripheral high socioeconomic status tracts are at the opposite end of the continuum. Some of the older or transitional areas are similar in many respects to the inner city tracts and some of the middle to high SES tracts are similar to the highest SES tracts. An additive summary at the bottom of each column indicates whether the tract's characteristics suggest a milieu generative of delinquency and crime in the area or by its residents.

Although we have suggested that one might characterize an area differently as crime-producing by its residents or crime-producing by the nature of its institutions, we shall forego that exercise at this point.

TABLE 1. SOCIAL, DEMOGRAPHIC, LAND USE, AND HOUSING CHARACTERISTICS OF RACINE CENSUS TRACTS

TYPES OF CENSUS TRACTS	Inner City				Older or Transitional				Peripheral Middle to High SES					Peripheral High SES	
	1	3	4	5	2	13	6	7	10	9	12	15	8	14	11
Population Trends															
Population Trend 1950-1980	D	D	D	D	D	D	D	S	I	I	I	I	I	I	I
Population Trend 1970-1980	D	$\underline{D}$	$\underline{D}$	D	$\underline{D}$	$\underline{D}$	D	$\underline{D}$	S	I	$\underline{D}$	I	S	$\underline{D}$	S
Change in Population Density 1960-80 (D=Dec., S=Stable, ID=Inc. to '70, then Dec., D=Dec. 15% or + = $\underline{D}$)	D	D	D	ID	D	D	D	D	I	I	ID	--	ID	ID	ID
Social Characteristics:1970 (L=Low, M=Med., H=High)															
Median Income	L	L	L	L	L	M	M	M	M	H	M	H	H	H	H
% White Collar Workers	L	L	L	L	M	H	M	H	M	M	M	H	M	H	H
% Male Civilian Labor Force Unemployed	H	H	H	H	M	M	M	L	M	L	L	M	L	M	L
% Income Below Poverty Level	H	H	H	H	H	M	M	M	M	L	M	L	L	M	L
% High School Grads of Persons 25 or Older	L	L	L	L	M	M	H	M	M	M	M	H	H	H	H
% 16-21 Years of Age Not H.S. Grads. and Not in School	--	H	H	H	H	L	M	L	M	M	M	--	L	L	L
Average % of Population Black in Block	M	H	H	H	M	L	L	L	L	L	L	L	L	L	L
Average % of Female Heads of Household	L	H	H	H	H	M	M	L	L	L	L	--	L	L	L
Land Use: 1970															
% Bus./Comm./Mfg./Ind. (L=Low, M=Med., H=High)	H	H	H	H	M	M	L	M	L	M	M	--	L	L	L
Target Density	H	H	H	H	M	M	L	L	M	M	L	--	M	M	L
Taverns	H	H	H	H	M	M	L	M	L	M	L	--	M	L	L
Residential Housing Quality: 1970															
Factor Scores	L	L	L	L	L	M	M	M	M	H	M	--	H	H	H
Geometric Scores	L	L	L	L	M	M	H	H	H	H	H	--	H	H	H
% Units Constructed 1939 or Earlier	H	H	H	H	H	H	H	M	M	L	M	L	L	L	M
% Residential Vacancy	H	H	H	H	M	M	L	L	M	L	L	M	L	M	L
Housing Exterior and Interior[1]	--	L	L	M	M	H	M	H	H	H	M	--	M	H	H
Housing Pict. Match[1]	--	L	L	L	L	L	M	M	M	M	M	H	M	H	H
Delinquency and Crime Producing Characteristics of Area[2]	H	H	H	H	M	M	M	M	M	L	M	L	L	L	L

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[1] From interviews and home visits with 651 persons who lived in Racine 1960-71.

[2] Additive summary of all items above.

Police Grid Areas: Table 2 contains similar but not quite as extensive data on police grid areas, less extensive because it must be generated from block data for which there are fewer variables than for tracts, some data for tracts being available in aggregated form beyond that available for blocks.

Inner city grids distinguish themselves by having characteristics which most other grids do not. The peripheral middle to high SES grids are in most respects at the other end of the continuum but some of these areas are not as sharply differentiated from the transitional or older stable residential areas as one might expect. Nevertheless, there are grids which are at one extreme of the continuum and grids which are at the other, even though the initial arrangement did not produce such a neat scheme as it did for tracts. Three of the peripheral middle to high SES grids were more similar to other grids than to their spatial proximates.

Natural Areas: Natural areas are supposed to be more homogeneous than tracts or grids. Since there are more of them we have organized them in five groups (see Table 3), only two of which turn out to contain only areas of similar delinquency and crime-producing characteristics. The four inner city areas are very similar, as are the five peripheral high SES areas. While the transitional areas are much like the inner city, the stable residential and new and peripheral residential areas are a mixed bag. What this means is that fixed notions about areas based on a few variables lead one to a false sense of homogeneity. The

TABLE 2. SOCIAL, DEMOGRAPHIC, LAND USE, AND HOUSING CHARACTERISTICS OF RACINE POLICE GRID AREAS

TYPES OF POLICE GRID AREAS	Inner City				Transitional			Stable Residential				Peripheral Middle to High SES								
	8	12	13	16	9	20	17	14	18	21	4	19	15	10	2	1	23	5	22	6
Population Trends																				
Population Trend 1950-1980	D	D	D	D	S	I	D	I	I	I	I	I	I	I	I	I	I	I	I	I
Population Trend 1970-1980 (D=Dec., S=Stable, I=Inc. D̲= Dec. 15% or +) (* Fairly Stable 1950-1980)	D	D̲	D	D̲	D̲	S	D̲	S	D	D	D̲	I	S	S	D̲	D	I	D̲	D	D̲
Change in Population Density 1960-80	D	D	D	D	D	I	D	S*	S*	D	S*	I	I	I	I	I	I	I	I	I
Social Characteristics: 1970																				
Mean Income[1] (L=Low, M=Med., H=High)	L	L	L	M	M	M	L	H	L	L	M	L	M	M	H	H	L	H	M	--
Household Possessions Scale[1]	L	L	L	L	M	M	M	M	L	M	H	M	M	H	H	H	H	M	M	--
Average Percent of Population Black in Block	M	H	H	H	M	H	M	L	L	L	L	L	L	L	L	L	L	L	L	L
Average Percent of Female Heads of Household	H	H	H	H	M	M	H	L	L	L	L	L	L	L	M	L	L	M	L	L
Land Use: 1970																				
Percent Bus./Comm./Mfg./Ind. (L=Low, M=Med., H=High)	M	H	H	H	H	L	H	L	L	L	L	M	L	L	L	L	--	M	M	H
Target Density	H	H	M	H	M	H	H	M	M	L	L	M	H	L	H	L	L	M	H	L
Taverns	H	H	M	H	M	H	H	L	L	L	L	L	L	L	L	L	L	M	L	L
Residential Housing Quality: 1970																				
Factor Scores	L	L	L	L	M	L	L	H	M	M	H	H	H	H	H	H	H	M	H	M
Geometric Scores	L	L	L	L	M	M	M	H	M	H	H	H	H	H	M	H	H	H	H	H
Percent Residential Vacancy	H	H	H	H	M	--	H	M	L	L	L	L	L	L	L	L	M	M	L	L
Housing Ext. & Interior[1]	M	L	M	M	L	M	M	H	H	M	H	H	H	H	H	H	H	H	H	--
Housing Pict. Match [1]	L	L	L	L	L	L	M	H	M	M	H	M	M	H	M	H	H	M	M	--
Delinquency and Crime Producing Characteristics of Area[2]	H	H	H	H	M	M	H	L	M	M	L	L	L	L	L	L	L	M	M	M

[1] From interviews and home visits with 651 persons who lived in Racine 1960-1971.

[2] Additive summary of all items above.

TABLE 3. SOCIAL, DEMOGRAPHIC, LAND USE, AND HOUSING CHARACTERISTICS OF RACINE NATURAL AREAS

TYPES OF NATURAL AREAS	Inner City				Trans-ition			Stable Residential							New & Peripheral Res.						Peripheral High SES				
	1	2	3	5	4	6	8	21	13	12	9	14	11	10	7	18	19	16	20	22	25	17	23	26	24
Population Trends																									
Population Trend 1950-80	I	D	D	D	D	D	I	D	D	I	S	I	D	D	I	I	I	I	I	I	I	I	I	I	I
Population Trend 1970-80	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	I	D	D	I	I	I
Change in Population Density 1960-80 (D=Dec., S=Stable, I=Inc.)	D	D	I	D	D	S	I	S	D	I	D	D	D	D	I	I	D	D	I	I	S	D	S	--	I
Social Characteristics: 1970 (L=Low, M=Med., H=High)																									
Mean Income[1]	L	L	L	M	L	M	L	--	H	L	M	M	M	M	L	H	M	M	H	L	H	H	L	M	--
Household Possessions Scale[1]	L	L	L	L	M	L	L	--	M	M	M	H	L	M	L	H	M	M	M	M	H	M	M	H	--
Average % of Pop. Black in Blocks	H	H	H	M	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Average % of Female Heads of Household	H	H	H	H	M	H	L	M	M	L	M	M	M	M	M	L	L	L	L	L	L	L	L	--	L
Land Use: 1970																									
% Bus./Comm./Mfg./Ind. (L=Low, M=Med., H=High)	H	H	H	M	M	M	L	L	M	M	M	L	M	H	L	L	M	L	L	M	L	L	L	H	L
Target Density	H	H	H	M	H	M	L	M	M	L	L	L	M	M	L	M	H	M	M	M	L	L	L	H	L
Taverns	H	H	H	M	H	M	L	M	M	L	M	L	L	M	L	L	L	L	L	L	L	L	L	L	L
Residential Housing Quality: 1970																									
Factor Scores	L	L	L	L	L	L	M	H	M	H	M	M	M	M	H	H	H	M	H	H	H	M	H	H	H
Geometric Scores	L	L	L	L	L	M	M	H	H	H	M	H	M	M	H	H	H	H	H	H	H	H	H	H	H
% Residential Vacancy	H	H	H	H	H	M	L	M	L	L	M	L	M	M	--	L	L	L	L	L	L	L	L	--	M
Housing Ext. & Int.[1]	L	L	M	M	H	M	M	--	L	L	L	M	L	H	M	H	H	L	H	H	H	H	H	H	--
Housing Pict. Match[1]	L	L	L	L	L	M	M	--	M	M	L	M	M	M	M	H	M	M	H	M	H	M	M	H	--
Delinquency & Crime Producing Characteristics of Area[2]	H	H	H	H	H	H	M	M	M	L	M	L	M	M	M	L	L	M	L	L	L	L	L	L	L

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[1] From interviews and home visits with 651 persons who lived in Racine 1960-1971. The small number of persons interviewed in some natural areas resulted in statistics for some variables that were inconsistent with the total response pattern for the area.

[2] Additive summary of all items above.

extremes are there and are consistently found but other areas are heterogeneous; we had best not be so sure what the rate of delinquency and crime will be in them.

<u>Neighborhoods</u>: Neighborhoods are arrayed in four groups in Table 4, commencing with 14 inner city areas, proceeding next to interstitial or transitional neighborhoods, of which there are also 14. There are 16 more or less stable middle class residential neighborhoods and 21 middle and upper SES neighborhoods that are more peripheral and generally newer. The reader is reminded that "neighborhoods" with numbers from 60 to 70 are not really neighborhoods in the same sense as the other neighborhoods. These all contain some residential dwelling units but are the predominantly commercial-industrial or green areas.

While some of the inner city neighborhoods have identical "codes" or patterns of characteristics, as do groups in each of the other areas, there are numerous types of neighborhoods throughout the city. We cannot, of course, take the position that no two neighborhoods are alike for were we to take this stance we must forget the whole enterprise. Without the possibility of categorizing there would be no basis for prediction or relating types of neighborhoods to sequences of delinquency and crime.

THE VALUES AND BEHAVIOR OF PEOPLE WITHIN EACH SPATIAL SYSTEM

In the earlier longitudinal study in Racine interviews were conducted with representative samples of adults circa 1960 and again in 1971. Of the 973 persons in the study, 651 stayed in

TABLE 4. SOCIAL, DEMOGRAPHIC, LAND USE, AND HOUSING CHARACTERISTICS OF NEIGHBORHOODS

TYPES OF NEIGHBORHOODS	Inner City														Interstitial or Transitional													
	17	8	7	13	61	1	6	12	9	5	11	10	2	3	19	18	16	4	65	64	46	49	50	54	66	33	37	60
Population Trends																												
Pop. Trend 1960-80	D	D	D	D	D	D	D	D	S	D	D	D	D	I	D	D	D	D	D	D	I	I	I	I	S	I	I	D
Pop. Trend 1970-80	D	D	D	S	D	D	D	D	D	D	D	D	D	S	D	D	D	D	S	S	D	D	D	D	D	D	I	D
Change in Pop. Density 1960-80	D	D	D	IS	DS	DS	D	D	D	D	D	D	D	IS	D	D	D	D	I	S	ID	D	ID	D	ID	D	I	D
(D=Dec., S=Stable, I=Inc., IS=Inc.-Stable,etc.)																												
Social Characteristics: 1970																												
Average % of Pop. Black in Block	M	H	H	H	H	M	M	H	H	M	H	H	H	H	L	L	M	L	L	M	L	M	L	L	L	L	M	M
Average % of Female Heads of Household	H	H	H	H	M	L	L	H	H	H	H	H	H	H	M	M	H	M	H	H	L	L	L	M	L	M	H	H
(L=Low, M=Med., H=High)																												
Land Use: 1970																												
Industrial vs. Residential	H	H	H	M	H	H	L	H	H	L	H	H	M	L	L	M	M	L	H	H	M	M	M	L	H	H	L	H
Target Density	H	H	H	H	M	H	L	M	H	H	H	H	H	L	M	H	H	L	H	L	L	H	L	L	L	M	H	M
Taverns	H	H	H	M	M	H	L	M	H	M	H	H	H	H	H	H	H	M	H	M	L	M	L	L	L	M	H	M
(L=Low, M=Med., H=High)																												
Residential Housing Quality: 1970																												
Factor Scores	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	M	M	L	M	M	M	M	M	M	L	L
Geometric Scores	L	L	L	L	L	L	M	L	L	L	L	L	L	L	L	L	L	H	L	L	M	M	H	M	L	M	L	M
(L=Poor Housing, M=Med., H=Best Housing)																												
% Residential Vacancy	H	H	H	H	L	H	H	H	H	H	H	H	H	H	M	H	H	M	L	H	M	M	L	L	L	M	H	H
Delinquency and Crime Producing Characteristics in Areas	H	H	H	H	H	H	M	H	H	H	H	H	H	H	H	H	H	M	H	H	M	M	L	M	M	M	M	H

TABLE 4. Page 2.

TYPES OF NEIGHBORHOODS	Stable Middle Class Residential															
	20	21	22	23	29	31	14	15	63	53	62	56	32	35	36	34
Population Trends																
Population Trend 1960-80	D	S	D	I	I	I	S	S	I	D	D	D	D	D	I	I
Population Trend 1970-80	D	D	D	D	D	D	D	D	D	D	S	D	D	D	D	D
Change in Population Density 1960-80	D	D	D	ID	ID	D	D	D	ID	D	DI	D	D	D	D	D
(D=Dec., S=Stable, I=Inc., IS=Inc.-Stable, etc.)																
Social Characteristics: 1970																
Average % of Pop. Black in Block	L	L	L	L	L	L	L	L	L	L	M	L	L	L	L	L
Average % of Female Heads of Household	L	L	M	M	L	L	M	L	L	M	M	M	M	L	L	L
(L=Low, M=Med., H=High)																
Land Use: 1970																
Industrial vs. Residential	M	L	M	M	H	M	L	L	L	M	L	M	M	H	L	L
Target Density	M	M	L	H	M	L	L	L	L	M	L	L	M	M	L	L
Taverns	M	M	M	M	L	L	L	L	L	L	L	L	M	L	L	L
(L=Low, M=Med., H=High)																
Residential Housing Quality: 1970																
Factor Scores	M	H	M	M	M	H	M	M	H	M	M	M	M	M	M	M
Geometric Scores	M	M	H	M	M	H	H	M	M	M	M	M	M	M	H	H
(L=Poor Housing, M=Med., H=Best Housing)																
% Residential Vacancy	H	L	M	M	M	M	L	M	M	H	M	M	M	M	M	L
Delinquency and Crime Producing Characteristics in Areas	M	M	M	M	M	L	M	M	L	M	M	M	M	M	L	L

TABLE 4. Page 3.

TYPES OF NEIGHBORHOODS	Outlying Middle and Upper SES																				
	27	28	51	52	55	67	47	38	57	24	25	26	30	70	39	41	42	68	48	58	59
Population Trends																					
Pop. Trend 1960-80	I	I	I	S	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Pop. Trend 1970-80	D	D	D	S	D	I	D	D	I	D	D	D	D	D	D	I	D	D	I	I	I
Change in Pop. Density 1960-80	D	D	D	D	D	I	D	SD	I	ID	ID	ID	ID	ID	SD	I	ID	ID	I	I	I
(D=Dec., S=Stable, I=Inc., IS=Inc.-Stable, etc.)																					
Social Characteristics: 1970																					
Average % of Pop. Black in Block	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Average % of Female Heads of Household	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
(L=Low, M=Med., H=High)																					
Land Use: 1970																					
Industrial vs. Residential	L	L	L	L	M	H	M	L	L	M	M	L	H	L	L	L	L	M	L	L	L
Target Density	L	L	M	L	M	H	M	M	M	M	L	L	L	H	M	L	H	H	L	L	L
Taverns	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
(L=Low, M=Med., H=High)																					
Residential Housing Quality: 1970																					
Factor Scores	H	H	H	H	M	H	H	H	M	H	H	H	H	H	H	H	H	H	H	H	H
Geometric Scores	H	H	H	H	H	H	H	M	H	H	H	H	H	M	H	H	H	M	H	H	H
(L=Poor Housing, M=Med., H=Best Housing)																					
% Residential Vacancy	L	M	M	L	M	M	L	L	H	L	L	L	L	M	L	L	M	M	M	M	M
Delinquency and Crime Producing Characteristics in Areas	L	L	L	L	M	M	L	L	L	L	L	L	L	M	L	L	L	M	L	L	L

Racine and were interviewed at length both years. (Others were interviewed both years but had not stayed in Racine, having moved to nearby communities or returned to their former homes.) A disproportional sampling ratio was utilized in this study in order to include sufficient numbers of the major minority groups, since the thrust of the project was to understand the process of adjustment for minority migrants to an urban community. As a consequence, of the 651 persons, 249 were White, 229 were Black, and 173 were Chicano.

Since there has been what many consider undue emphasis on race and ethnicity in the search for causal explanations of delinquency and crime in the city, we were fortunate that the data permitted examination of race/ethnic variation in attitudes and behavior in these areas which have high delinquency and crime rates.

Census Tracts: Table 5 reveals that there is indeed variation in responses to questions posed in the interviews[1] but that tract variation is not as easy to interpret as it was for the population, demographic, land use, and housing score data presented in Table 1. Indeed, for many of the variables there seems to be no pattern at all. If a simple additive scale is made (excluding job stability because our measure is difficult to interpret--it can be thought of as either stability or stagnation) the three inner city tracts differ distinctly from the two peripheral high SES tracts but the remaining nine tracts show a variety of patterned responses to the variables. Few of

TABLE 5. CHARACTERISTICS OF RACINE CENSUS TRACTS BASED ON INTERVIEWS WITH 651 PERSONS WHO LIVED IN RACINE 1960-1972

TYPES OF CENSUS TRACTS	Inner City[1]			Older or Transitional				Peripheral Middle to High SES					Peripheral High SES	
	3	4	5	2	13	6	7	10	9	12	15	8	14	11
Work														
Job Stability: 1960	H	H	M	M	H	H	H	L	H	H	--	L	M	H
Occup. Level of Associates: 1970	L	L	L	M	M	M	H	M	H	H	--	L	H	H
Occup. Level of Associates: 1960	L	L	L	M	H	H	H	M	M	M	--	H	H	H
Satisfaction with Pay: 1970	M	M	L	M	M	H	L	M	M	M	H	H	M	H
(L=Low, M=Med., H=High)														
Antecedent Handicap Scale: 1960	M	M	H	L	L	L	L	L	L	M	--	M	L	L
Level of Education: 1960														
Husband	L	L	L	H	M	H	H	M	M	H	--	H	H	H
Wife	L	L	M	M	H	H	H	M	H	M	--	M	H	H
Level of Aspiration in Family: 1960	M	M	L	M	H	L	H	L	H	L	--	H	H	H
Attitudes Toward Education														
% Believing Education More Important Today: 1960	M	H	M	L	L	M	L	L	L	L	--	H	M	H
% Disagreeing that Children Cannot be Kept in School past 12th Grade: 1970	M	M	M	M	M	M	H	M	H	M	H	M	H	H
1960	L	L	L	M	H	L	H	L	M	M	--	M	M	H
% Dissatisfied with High School or Less Education for Children: 1970	M	L	M	H	M	H	H	M	M	H	H	L	H	H
1960	M	L	L	H	H	L	M	M	L	M	--	H	M	H
Social Participation and World View														
Social Participation Scale: 1960														
Husband	L	L	L	M	M	H	H	M	H	M	--	L	H	M
Wife	L	L	L	L	M	H	H	L	H	L	--	L	H	H
% With Friends of Different Ethnicity: 1970	H	H	H	M	M	L	L	M	H	H	L	H	L	L
% With Active World View: 1970	M	M	M	M	M	L	M	M	M	M	H	M	H	M
% With Active World View: 1960	L	L	L	L	M	H	M	M	M	L	--	M	L	M
% Heard of Social & Welfare Orgs.: 1970	L	M	M	M	M	H	H	M	H	M	H	L	H	H
1960	L	L	M	M	L	H	M	M	L	M	--	H	L	H
% Who Go to Taverns: Husband 1970	H	H	M	M	M	M	M	L	M	L	M	M	L	M
1960	M	H	M	M	L	H	L	L	M	H	--	H	H	H
% Who Go to Taverns: Wife 1970	M	L	L	M	M	H	H	M	L	M	H	L	L	M
1960	L	M	L	H	L	M	M	M	M	H	--	M	H	H
Summed Characteristics[3]	H	H	H	M	M	M	M	M	M	M	--	M	L	L

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[1] Insufficient persons were interviewed from Tract 1 for a statistic.
[2] Wife cutting points 20% lower than husband.
[3] Additive summary of all items except job stability.

these nine tracts are at extremes of the various continua but there are a variety of patterns which given them simple additive scores falling between the extreme groups of tracts. It should also be noted that in two of the older or transitional areas (13 and 16) there were several changes between the mean response categories in 1960 and 1971 which could be interpreted as indication of the declining status of the areas' residents, and others which could not. Similar changes took place in peripheral middle to high SES tracts that had not been characterized as transitional so that it is difficult to say that these data differentiate between the two larger groups of tracts. We must still conclude that people are not out of a companion mold to their demograhic and socioeconomic status milieu, at least as represented by their position on a variety of continua on Tables 1 and 5.

One further aspect of the problem should be mentioned. While each tract is characterized by its relative position on each continuum for all persons in the sample who resided in the tract in 1960 or 1971, there is considerable variation by race/ethnicity in the tracts which contain sufficient members of each race/ethnic group for comparison. In Tracts 3, 4, and 5 the total for both years is greatly influenced by the characteristics of the Black and Chicano populations. In 1971 the Chicano population influenced the characteristics of Tract 8. For example, the Whites in Tracts 3, 4, and 5 had low antecedent handicap scores, the Blacks medium, and the Chicanos high scores.

On the other hand, a greater percent of the Blacks in Tract 5 had higher levels of aspiration for their children than did either Whites or Chicanos. Similarly, on a specific question a low percent of the Blacks in that tract would be satisfied with high school or less for their children than would be the Whites or Chicanos, the Chicanos having the highest percent who would be satisfied with high school or less. Yet Whites in Tract 5 had more active world views in 1960 than did Blacks and Chicanos and were least active in 1971. Tavern attendance was reversed (some might say that this is consistent with other indicators in 1971) with a larger percent of the Chicanos stating that they went to taverns but the White males having the smallest percent who went to taverns. In 1960, however, Whites had the highest percent who attended taverns and Blacks had the lowest percent who did so. Although one could present a lengthy discussion of inter-ethnic and racial differences, the point is that one must not submit to the ecological fallacy and assume that tracts are homogeneous. There is much variation in them by race/ethnicity and variation within each race/ethnic group as well.

Police Grid Areas: The characteristics of police grid areas are presented in Table 6 and are summed with results similar to those for census tracts. Three of the four inner city grids are relatively homogeneous as are the peripheral areas for which there were sufficient data to produce an overall "score." The two groupings in between differ from the areas at the extremes but the transitional areas are generally more like the inner city

TABLE 6. CHARACTERISTICS OF RACINE POLICE GRID AREAS BASED ON INTERVIEWS WITH 651 PERSONS WHO LIVED IN RACINE 1960-1971

TYPE OF POLICE GRID AREA	Inner City				Transitional			Stable Residential				Peripheral Middle to High SES							
	8	12	13	16	9	20	17	14	18	21	4	19	15	10	2	1	23	5	22
Work																			
Job Stability: 1960	L	M	H	H	M	L	M	L	L	H	M	--	--	--	--	H	--	M	H
Occup. Level of Associates: 1970	L	L	L	L	L	L	M	M	H	M	H	M	L	H	H	H	M	H	M
Occup. Level of Associates: 1960	L	L	L	L	M	L	M	H	M	M	H	--	--	--	--	M	--	M	L
Satisfaction with Pay: 1970 (L=Low, M=Med., H=High)	M	M	M	M	L	H	M	M	H	M	H	L	--	--	L	H	L	L	M
Antecedent Handicap Scale: 1960	M	H	H	M	M	H	M	L	L	H	--	--	--	--	--	--	--	L	M
Level of Education: 1960																			
Husband	L	L	L	M	M	L	M	H	M	L	H	L	--	--	--	L	--	H	L
Wife	L	L	M	L	M	L	M	M	H	L	H	--	--	--	--	--	--	H	H
Level of Aspiration in Family: 1960	M	L	L	M	M	L	M	H	L	M	H	--	--	--	--	H	--	L	M
Attitudes Toward Education																			
% Believing Education More Important Today: 1960	M	M	M	M	H	L	M	M	L	H	L	--	--	--	--	L	--	H	--
% Disagreeing that Children Cannot be Kept in School past 12th Grade: 1970	M	M	L	M	M	L	M	M	M	M	H	L	H	H	H	H	L	M	H
1960	L	L	M	L	M	L	L	M	L	M	H	--	--	--	--	H	--	M	M
% Dissatisfied with High School or Less Education for Children: 1970	M	M	M	H	L	M	H	H	M	M	H	L	M	H	L	H	H	M	H
1960	M	M	M	M	L	L	M	M	M	L	H	--	--	--	--	L	--	H	L
Social Participation and World View																			
Social Participation Scale: 1960																			
Husband	M	L	L	L	M	L	M	H	M	L	M	--	--	--	--	L	--	M	H
Wife	L	M	L	L	M	L	L	H	M	L	M	--	--	--	--	M	--	H	M
% With Friends of Different Ethnicity: 1970	H	M	H	H	M	H	H	L	H	M	L	M	L	L	L	L	L	M	M

TABLE 6. cont.

	Inner City				Transitional			Stable Residential				Peripheral Middle to High SES							
TYPE OF POLICE GRID AREA	8	12	13	16	9	20	17	14	18	21	4	19	15	10	2	1	23	5	22
% With Active World View: 1970	M	M	M	M	M	H	L	H	H	M	H	L	L	M	L	H	M	M	L
% With Active World View: 1960	L	L	L	L	L	L	L	M	M	L	M	--	--	--	--	L	--	H	L
% Heard of Social & Welfare Orgs.:																			
1970	M	L	M	M	M	M	H	H	M	M	H	H	M	H	H	H	H	M	H
1960	L	L	L	L	L	--	M	H	M	H	L	--	--	--	--	M	--	L	--
% Who Go to Taverns: Husband																			
1970	H	M	M	H	H	M	H	H	L	M	L	M	L	L	H	L	L	L	H
1960	M	H	M	M	H	H	L	H	L	M	L	--	--	--	--	L	--	H	H
% Who Go to Taverns: Wife																			
1970	M	L	L	M	L	L	M	M	M	L	L	M	L	--	H	M	L	L	M
1960	M	M	M	L	M	L	L	H	M	L	M	--	--	--	--	H	--	M	H
Summed Characteristics	H	H	H	M	M	M	M	L	L	M	L	--	--	--	--	L	L	L	M

and the stable residential areas are more like the peripheral areas.

Here again we find race/ethnic variation in the inner city and transitional areas, all of which have total scores heavily influenced by the Black and Chicano populations of these areas. For example, although the residents of Grid Areas 8, 12, and 13 fell in the middle category of pay satisfaction, the Blacks in each area were in the low and the Chicanos in the high satisfaction group. Whites in Grid Area 13 had low, in Grid 8 middle, and in Grid 12 high satisfaction. Since the point has been made that there is considerable race/ethnic variation within areas, we shall not pursue these differences further except to say that the interrelationship of response patterns from question to question indicates that attitude patterns vary from area to area and within area by race/ethnicity even in those areas that seem to have a superficial homogeneity. All of this lies behind the difficulty that has been experienced in making sociological predictions with no more than broad status indicators.

<u>Natural Areas</u>: Residents of the two large inner city natural areas gave similar responses to interview questions (Table 7). The other inner city areas (3 and 5) were similar to them in some respects but unlike them in other respects. The two peripheral high SES areas whose scores could be summarized were at the opposite extreme in their response patterns but similar in many respects to the other peripheral areas. One must conclude that aggregating the interview responses by natural areas adds,

TABLE 7. CHARACTERISTICS OF RACINE NATURAL AREAS BASED ON INTERVIEWS WITH 651 PERSONS WHO LIVED IN RACINE 1960-1971

	Inner City				Transi-tional			Stable Residential						New and Peripheral Residential						Peripheral High SES			
TYPE OF NATURAL AREA	1	2	3	5	4	6	8	13	12	9	14	11	10	7	18	19	16	20	22	25	17	23	26
Work																							
Job Stability: 1960	M	H	M	M	L	M	M	H	H	--	H	L	M	--	L	H	L	M	--	H	M	--	--
Occup. Level of Associates: 1970	L	L	L	L	L	L	M	H	M	L	M	L	H	L	M	H	H	H	H	H	H	H	H
Occup. Level of Associates: 1960	L	L	L	L	M	H	M	M	--	--	H	H	H	--	H	H	M	H	--	H	H	--	--
Satisfaction with Pay: 1970	M	M	L	L	H	H	H	L	L	L	H	M	L	M	H	H	H	H	L	H	M	H	L
(L=Low, M=Med., H=High)																							
Antecedent Handicap Scale: 1960	H	H	M	M	L	L	M	L	M	--	L	--	--	--	--	L	L	L	--	--	L	--	--
Level of Education: 1960																							
Husband	L	L	M	M	L	M	M	H	H	--	M	H	H	--	H	M	M	H	--	H	H	--	--
Wife	L	L	M	M	L	M	M	--	M	--	H	H	H	--	H	H	H	H	--	--	M	--	--
Level of Aspiration in Family: 1960	L	M	M	L	M	H	L	M	L	--	L	M	M	--	H	H	L	H	--	H	M	--	--
Attitudes Toward Education																							
% Believing Education More Important Today: 1960	H	M	M	L	M	H	H	M	L	--	H	L	L	--	M	M	L	H	--	M	M	--	--
% Disagreeing that Children Cannot be Kept in School past 12th Grade: 1970	L	M	M	M	M	H	H	M	M	--	M	L	H	M	H	H	H	H	L	H	L	M	H
1960	L	L	--	L	M	L	L	H	M	--	L	M	H	--	H	H	M	M	--	H	M	--	--
% Dissatisfied with High School or Less Education for Children: 1970	L	M	M	M	M	M	M	L	H	M	H	H	H	--	H	M	M	H	M	H	H	L	L
1960	L	M	L	M	M	M	M	H	M	--	M	H	M	--	M	L	M	H	--	H	L	--	--
Social Participation and World View																							
Social Participation Scale: 1960																							
Husband	L	L	L	L	M	L	M	M	M	--	M	H	H	--	L	--	M	H	--	H	M	--	--
Wife	L	L	L	H	M	L	M	M	L	--	H	H	M	--	H	M	L	H	--	H	M	--	--

TABLE 7. cont.

	Inner City				Transitional			Stable Residential						New and Peripheral Residential						Peripheral High SES			
TYPE OF NATURAL AREA	1	2	3	5	4	6	8	13	12	9	14	11	10	7	18	19	16	20	22	25	17	23	26
% With Friends of Different Ethnicity: 1970	H	H	H	L	M	H	H	L	H	H	M	M	M	M	L	H	M	M	M	L	L	L	L
% With Active World View: 1970	M	M	M	M	M	H	M	H	L	M	M	H	M	L	H	M	H	M	L	H	M	L	M
% With Active World View: 1960	L	L	M	L	L	L	M	M	L	--	H	M	H	--	M	H	M	M	--	M	L	--	--
% Heard of Social & Welfare Orgs.:																							
1970	M	M	H	M	M	M	M	L	M	M	H	M	H	L	H	H	M	H	M	H	H	L	H
1960	L	L	--	M	L	--	--	--	--	--	M	M	H	--	L	M	H	H	--	L	H	--	--
% Who Go to Taverns: Husband																							
1970	H	H	M	H	H	M	H	L	L	--	L	H	H	M	H	M	L	L	L	L	M	H	M
1960	H	M	L	M	M	H	M	M	H	--	H	H	M	--	M	H	L	H	--	L	M	--	--
% Who Go to Taverns: Wife																							
1970	L	L	L	L	H	M	H	L	M	H	L	H	H	L	M	L	L	L	L	L	M	H	H
1960	M	L	L	M	M	L	H	M	H	--	H	H	M	--	H	H	L	M	--	H	M	--	--
Summed Characteristics	H	H	M	M	M	M	M	L	M	--	L	M	L	--	L	L	L	L	--	L	L	--	--

as it did with other spatial systems, to an impression of heterogeneity within groups.

As was true for other spatial systems there were interesting race/ethnic differences within areas. Those Whites residing in Natural Areas 1 and 2 had low antecedent handicap scores while Blacks and Chicanos had high average scores on this scale. On the other hand, all race/ethnic groups in Natural Area 1 thought in 1971 that it would be difficult to keep their children in school past the 12th grade and had low level of aspiration scores for their children.

Neighborhoods: Adding the behavior and attitudinal component to the neighborhood data presented a problem because the 651 interviews were spread over some 60 neighborhoods, leaving only 20 with large enough numbers of people to have any confidence in the statistics (Table 8). Furthermore, since the cutting points for each variable were based on the distributions for tracts, grids, and natural areas, these cutting points might not divide the 20 neighborhoods into a range of groups. Added to this is the fact that most of the neighborhoods with sufficient people for a reliable statistic were found in the more densely populated inner city and interstitial areas. Ending up with 18 out of 20 neighborhoods for the inner city and interstitial areas resulted in a group whose summary scores were in a small range achieved through numerous response patterns. In other words, the inner city and interstitial neighborhoods had a variety of combinations of average responses to the interview questions--a

TABLE 8. CHARACTERISTICS OF RACINE NEIGHBORHOODS BASED ON INTERVIEWS WITH 651 PERSONS WHO LIVED IN RACINE 1960-1971

TYPE OF NEIGHBORHOOD	Poor Housing and Medium to High Targets Inner City and Interstitial																		Peripheral Areas	
	9	16	8	3	61	12	17	11	7	2	10	13	5	50	49	37	18	46	38	55
Work																				
Job Stability: 1960	H	L	L	L	H	M	M	H	L	H	L	M	M	--	--	H	--	--	L	L
Occup. Level of Associates: 1970	L	M	L	L	--	L	L	L	L	L	--	L	M	M	H	L	L	L	M	H
Occup. Level of Associates: 1960	L	H	M	L	L	M	L	M	L	L	L	L	M	--	--	L	--	M	H	M
Satisfaction with Pay: 1970	L	L	M	H	--	M	H	M	M	L	H	M	M	M	M	H	H	H	L	H
(L=Low, M=Med., H=High)																				
Antecedent Handicap Scale: 1960	H	L	M	H	H	H	H	M	H	M	H	H	M	--	--	H	--	--	L	L
Level of Education: 1960																				
Husband	L	M	L	L	L	L	L	L	L	M	M	L	M	--	M	L	M	M	H	H
Wife	M	L	L	L	L	L	L	L	L	M	M	M	M	M	--	L	H	M	M	H
Level of Aspiration in Family: 1960	M	M	M	L	H	M	L	M	L	M	M	L	M	--	H	M	M	--	H	L
Attitudes Toward Education																				
% Believing Education More Important Today: 1960	M	M	H	L	H	--	H	M	H	L	L	M	M	--	M	H	M	H	M	--
% Disagreeing that Children Cannot be Kept in School past 12th Grade: 1970	H	M	L	M	--	M	M	L	L	H	H	L	M	H	M	L	L	L	M	L
1960	M	H	L	L	L	M	L	L	L	M	M	L	L	--	--	L	--	--	H	L
% Dissatisfied with High School or Less Education for Children: 1970	H	M	L	M	--	M	M	L	L	H	H	L	M	H	M	L	L	L	M	L
1960	M	H	L	L	L	M	L	L	L	M	M	L	L	--	--	L	--	--	H	L
Social Participation and World View																				
Social Participation Scale: 1960																				
Husband	L	M	L	L	L	M	M	L	L	L	L	L	L	H	H	L	M	L	M	H
Wife	L	H	M	L	L	M	L	L	L	L	L	L	L	--	M	L	L	H	L	M

Table 8 cont.

TYPE OF NEIGHBORHOOD	Poor Housing and Medium to High Targets Inner City and Interstitial																		Peripheral Areas	
	9	16	8	3	61	12	17	11	7	2	10	13	5	50	49	37	18	46	38	55
% With Friends of Different Ethnicity: 1970	H	L	H	H	--	M	H	H	H	H	H	H	--	H	H	M	M	H	H	L
% With Active World View: 1970	M	H	M	H	--	M	--	H	M	M	L	L	H	L	H	H	M	M	M	H
% With Active World View: 1960	L	L	L	L	H	L	L	L	L	L	L	L	L	--	--	L	--	--	M	M
% Heard of Social & Welfare Orgs.:																				
1970	M	L	M	M	--	L	M	H	M	M	H	M	H	M	H	L	H	M	H	L
1960	M	L	L	L	L	L	--	--	L	L	H	M	--	--	--	H	--	--	H	--
% Who Go to Taverns: Husband																				
1970	L	M	H	M	--	H	M	H	M	H	M	H	M	H	L	M	H	H	M	L
1960	M	H	H	H	M	H	M	L	H	L	L	M	H	--	--	M	--	M	H	L
% Who Go to Taverns: Wife																				
1970	L	M	L	L	--	L	M	H	L	M	H	L	M	M	L	L	H	H	H	L
1960	L	H	M	L	M	M	L	L	M	L	M	M	M	--	L	L	M	H	M	L
Summed Characteristics	M	M	H	H	M	M	H	H	H	M	M	H	M	M	L	H	M	M	L	L

further demonstration of the heterogeneity of neighborhoods but further support for the neighborhoods as an appropriate unit of analysis.

We conclude this appendix with the admonition that while we have found heterogeneity within groups and within the units of each group, our basic concern in this analysis is whether spatial units (in spite of their heterogeneity) may be used to capture change in the social organization of the city which is related to change in the spatial distribution of delinquency and crime. Heterogeneity may reduce the correlations but does not eliminate the possibility of a generally positive finding.

FOOTNOTES

[1] Job stability refers to the number of jobs that the head of the household had from first to and including present job in 1960. Occupational level of associates in 1971 refers to occupational level of fist and second mentioned friends in Racine, first mentioned relative in Racine, and first and second mentioned non-Racine relatives. A similar scale including only mention of relatives was employed in 1960. The antecedent handicap scale was based on region of former home before moving to Racine, husband's father's occupation, length of time respondent had lived in Racine as of 1960, years of education of husband, and occupational level of husband's first job. Level of education refers to years of education given by husband or given for husband by spouse in 1960 or the opposite. Level of aspiration in family was developed from responses to questions about attitude toward the importance of education now compared to when respondent was in school, how much education respondent wants children to have, whether respondent thinks most valuable training for child is school vs. home, job, or other, respondent's report on how oldest child is doing in school in terms of grades, respondent's assessment of financial ability to keep children in school through various levels, the kinds of work that respondent believes children would like to go into, and the level of education for children with which respondent would be satisfied. The three specific questions on education have been mentioned above. The social participation scale is based on

reported participation in or attendance by husbands and wives for themselves and spouses and refers to movies, dances or parties, sports or hobbies, taverns, fishing or hunting, church organizations, and clubs. Tavern attendance has been selected as a specific item from this group. The question on friends of a different race/ethnicity refers to responses to a question as to whether or not respondent had any friends who were not of their own race/ethnicity. The world view scale ranged from active to passive based on responses to several questions dealing with future orientation vs. present orientation, ability to plan for future vs. inability to do so, desirability of working alone vs. working as a member of the group, and so on. The scale on heard of organizations was based on recognition of nine social and welfare organizations ranging from the Red Cross to the Muslim Temple.

APPENDIX F

TABLE 1. CUTTING POINTS FOR TARGET DENSITY, LAND USE, VACANCY RATE, HOUSING TYPE, ARREST RATES, OFFENSE RATES, POLICE CONTACT RATES FOR CENSUS TRACTS, POLICE GRID AREAS, AND NATURAL AREAS

	CENSUS TRACTS			POLICE GRID AREAS		
Target Density	Low	Medium	High	Low	Medium	High
1950	(.00 to .12)	(.18 to .27)	(.41 to 1.94)	(.00 to .09)	(.17 to .25)	(.45 to 2.00)
1960	(.06 to .14)	(.19 to .30)	(.40 to 2.47)	(.00 to .08)	(.16 to .36)	(.44 to .91)
1970	(.11 to .14)	(.19 to .36)	(.51 to 1.11)	(.00 to .12)	(.15 to .37)	(.40 to .67)
Change	Decreasing	Stable	Increasing	Decreasing	Stable	Increasing
1950-60	(-.14 to -.06)	(-.05 to .03)	(.06 to .53)	(-.18 to -.08)	(-.05 to .03)	(.07 to .17)
1960-70	(-1.36 to -.13)	(-.05 to .04)	(.06 to .18)	(-.44 to -.09)	(-.05 to .04)	(.07 to .44)
Commercial Industrial	Low	Medium	High	Low	Medium	High
1950	(.00 to 16.8)	(18.9 to 32.8)	(35.0 to 90.0)	(.00 to 8.0)	(22.3 to 33.3)	(35.4 to 58.1)
1960	(3.9 to 13.7)	(17.3 to 26.9)	(42.5 to 85.1)	(5.1 to 16.0)	(19.3 to 33.3)	(36.3 to 54.2)
1970	(6.0 to 12.6)	(19.6 to 22.7)	(39.7 to 78.2)	(6.7 to 14.5)	(18.6 to 32.2)	(34.0 to 56.3)
Change	Decreasing	Stable	Increasing	Decreasing	Stable	Increasing
1950-60	(-8.1 to -4.9)	(-1.0 to 1.1)	(4.3 to 10.9)	(-23.7 to -3.3)	(-1.6 to .3)	(3.1 to 36.6)
1960-70	(-10.7 to -2.4)	(-1.2 to 0.0)	(2.3 to 3.3)	(-13.4 to -2.1)	(-1.6 to 1.7)	(2.3 to 11.2)
Residential Vacancies	Low	Medium	High	Low	Medium	High
1950	(.19 to .89)	(1.20 to 2.39)	(76.19)	(.00 to .90)	(1.13 to 1.79)	(6.06)
1960	(.57 to .95)	(1.30 to 3.67)	(3.96 to 9.99)	(.44 to .96)	(1.45 to 3.35)	(4.20 to 13.94)
1970		(1.29 to 2.95)	(4.25 to 11.47)	(.00 to .91)	(1.03 to 3.89)	(4.09 to 8.3)
Change	Decreasing	Stable	Increasing	Decreasing	Stable	Increasing
1950-60	(-75.62 to -.26)	(.14 to 1.80)	(2.78 to 9.80)	(-5.88 to -.26)	(1.08 to 2.27)	(2.51 to 13.94)
1960-70	(-3.30 to -1.42)	(-.01 to 1.32)	(3.56 to 7.39)	(-13.54 to -.18)	(.29 to 1.53)	(2.40 to 4.56)
Factor Score	Poor	Medium	Good	Poor	Medium	Good
1950	(-1.118 to -.557)	(-.231 to .258)	(.401 to 1.006)	(-.70 to -.314)	(-.124 to .340)	(.570 to 1.001)
1960	(-1.651 to -1.012)	(-.193 to .357)	(.622 to .994)	(-1.186 to -.443)	(-.267 to .394)	(.500 to 1.320)
1970	(-1.976 to -.540)	(-.112 to .314)	(.829)	(-1.281 to -.308)	(-.119 to .353)	(.486 to 1.475)
Change	Deteriorating	Stable	Improving	Deteriorating	Stable	Improving
1950-60	(-.598 to -.348)	(-.209 to .054)	(.342 to .588)	(-.486 to -.274)	(-.217 to .229)	(.440 to 1.470)
1960-70	(-.347 to -.309)	(-.204 to .166)		(-.370 to -.246)	(-.223 to .217)	(.849 to 1.475)

Table 1, page 2

	NATURAL AREAS			TOTAL		
Target Density	Low	Medium	High	Low	Medium	High
1950	(.03 to .14)	(.17 to .37)	(.50 to 1.11)	(.00 to .14)	(.17 to .37)	(.41 to 2.00)
1960	(.04 to .11)	(.20 to .37)	(.44 to 1.01)	(.00 to .14)	(.16 to .37)	(.40 to 2.47)
1970	(.00 to .13)	(.17 to .30)	(.41 to .79)	(.00 to .14)	(.15 to .37)	(.40 to 1.11)
Change	Decreasing	Stable	Increasing	Decreasing	Stable	Increasing
1950-60	(-.17 to -.10)	(-.05 to .03)	(.04 to .19)	(-.18 to -.06)	(-.05 to .03)	(.04 to .53)
1960-70	(-.52 to -.10)	(-.05 to .01)	(.05 to .15)	(-1.36 to -.09)	(-.05 to .04)	(.05 to .44)
Commercial Industrial						
1950	(1.3 to 16.2)	(19.1 to 30.0)	(34.0 to 70.7)	(.00 to 16.8)	(18.9 to 33.3)	(34.0 to 90.0)
1960	(2.1 to 14.3)	(19.2 to 30.5)	(38.5 to 64.5)	(2.1 to 16.0)	(17.3 to 33.3)	(36.3 to 85.1)
1970	(.00 to 14.3)	(17.9 to 33.3)	(36.6 to 60.7)	(.00 to 14.5)	(17.9 to 33.3)	(34.0 to 78.2)
Change	Decreasing	Stable	Increasing	Decreasing	Stable	Increasing
1950-60	(-14.1 to -3.0)	(-.4 to .6)	(4.2 to 10.5)	(-23.7 to -3.0)	(-1.6 to 1.1)	(3.1 to 36.6)
1960-70	(-16.7 to -1.9)	(-1.2 to 1.3)	(4.0 to 33.3)	(-16.7 to -1.9)	(-1.6 to 1.7)	(2.3 to 33.3)
Residential Vacancies	Low	Medium	High	Low	Medium	High
1950	(.15 to .94)	(1.01 to 2.94)	(7.27)	(.00 to .94)	(1.01 to 2.94)	(6.06 to 76.19)
1960	(.41 to .82)	(1.12 to 3.73)	(4.34 to 6.07)	(.41 to .95)	(1.12 to 3.73)	(3.96 to 13.94)
1970	(.61 to .97)	(1.06 to 3.79)	(4.07 to 10.16)	(.00 to .97)	(1.03 to 3.89)	(4.07 to 11.47)
Change	Decreasing	Stable	Increasing	Decreasing	Stable	Increasing
1950-60	(-6.86 to -.51)	(.20 to 1.31)	(2.38 to 5.61)	(-75.62 to -.26)	(.14 to 2.27)	(2.38 to 13.94)
1960-70	(-3.93 to -.51)	(.30 to 1.56)	(2.61 to 4.74)	(-13.54 to -.18)	(-.01 to 1.56)	(2.40 to 7.39)
Factor Score	Poor	Medium	Good	Poor	Medium	Good
1950	(-1.026 to -.337)	(-.118 to .331)	(.578 to 1.651)	(-1.118 to -.314)	(-.231 to .340)	(.401 to 1.651)
1960	(-1.524 to -.331)	(-.219 to .354)	(.423 to 1.616)	(-1.651 to -.331)	(-.267 to .394)	(.423 to 1.616)
1970	(-1.322 to -.518)	(-.267 to .314)	(.415 to 1.475)	(-1.976 to -.308)	(-.267 to .353)	(.415 to 1.475)
Change	Deteriorating	Stable	Improving	Deteriorating	Stable	Improving
1950-60	(-.970 to -.238)	(-.224 to .171)	(.269 to 1.168)	(-.970 to -.238)	(-.224 to .229)	(.269 to 1.470)
1960-70	(-.580 to -.245)	(-.194 to .202)	(.255 to 1.475)	(-.580 to -.245)	(-.223 to .217)	(.255 to 1.475)

Table 1, page 3

CENSUS TRACTS

Arrests Part I & II	Low	Medium	High
1966	(1.134 to 2.089)	(2.733 to 2.808)	(5.286 to 14.768)
1970	(1.226 to 2.342)	(2.458 to 3.412)	(4.248 to 33.657)
1975	(1.798 to 2.117)	(2.713 to 3.850)	(5.144 to 42.000)

Change	High Dec	Med Dec	Low Dec	Stable	Low Inc	Med Inc	High Inc
1966-69			(-.288)	(.082 to .224)	(.677 to 1.301)	(2.069 to 3.230)	(10.95)
1970-74			(-.371 to -.332)	(.081)	(.400 to 1.262)	(2.588 to 3.112)	(5.378 to 5.980)
1975-78	(-8.667 to -4.726)	(-3.119 to -1.502)	(-1.209 to -.138)				

Offenses	Low	Medium	High
1970	(2.057 to 3.112)	(4.416 to 7.537)	(9.606 to 105.502)
1975	(2.140 to 3.178)	(5.562 to 8.370)	(9.032 to 200.500)

Change	High Dec	Med Dec	Low Dec	Stable	Low Inc	Med Inc	High Inc
1970-74			(-.295 to -.208)		(.687 to 2.164)	(3.303 to 5.903)	(9.091 to 104.858)
1975-78	(-5.412 to -2.890)	(-1.617 to -1.003)	(-.677 to -.488)	(.052)	(.356)		(42.460)

POLICE GRID AREAS

Offenses Committed Part I	Low	Medium	High
1968	(.438 to 3.257)	(4.411 to 6.970)	(8.010 to 15.198)
1970	(1.136 to 3.074)	(3.627 to 6.427)	(7.688 to 17.110)
1975	(1.909 to 3.483)	(4.177 to 6.849)	(8.221 to 25.889)

Change	High Dec	Med Dec	Low Dec	Stable	Low Inc	Med Inc	High Inc
1968-70			(-1.457 to -.219)	(.005 to .129)	(.571 to 1.088)	(1.513 to 3.369)	
1970-74			(-.574 to -.461)	(.040 to .078)	(.322 to 1.335)	(2.159 to 3.781)	(3.926 to 9.874)
1975-79	(-10.170 to -3.473)	(-3.226 to -2.257)	(-1.426 to -.037)	(.029)			(3.994)

NATURAL AREAS

Police Contact Rates	Low	Medium	High
1942	(1.14 to 3.45)	(3.61 to 5.61)	(13.5)
1949	(2.14 to 3.49)	(3.51 to 5.73)	(7.0 to 17.5)
1955	(1.49 to 3.20)	(4.42 to 6.88)	(8.15 to 32.5)

Change	Med Dec	Low Dec	Stable	Low Inc	Med Inc	High Inc
1942-49			(.13)	(.30 to 1.39)	(1.97 to 3.57)	(3.89 to 8.75)
1949-55	(-1.8 to -1.04)	(-.89 to -.08)		(.37 to 1.42)	(1.50 to 3.57)	(7.34 to 18.50)

APPENDIX G

SKEWNESS AND OTHER DATA DISTRIBUTION PROBLEMS

The three procedures discussed in this appendix deal with problems associated with skewness, heteroscedasticity, and nonlinearity, and with the measurement of change. Table 1 presents data on the degree of skewness in the various tract characteristics. These data indicate that there is a high degree of skew in such variables as percent residential vacancies, targets, and so on. Skewness presents a problem in correlational analysis since a few cases with extreme scores (outliers) can inflate the correlation coefficient and lead to incorrect inferences about the general nature of the relationship. This problem is further aggravated by the small numbers of census tracts and grids. One solution to dealing with skewness is to eliminate the outliers from the analysis. Another is to transform the variables (e.g., by using a square root or logarithmic transformation). The results of both solutions are described.

The problems of heteroscedasticity and nonlinearity are treated as one in the present context since nonlinearity may be the result of skewness and/or the violation of the assumption of homoscedasticity in multiple regression analysis. Our concern with this issue stems from the fact that a few tracts (or grids) have extreme scores on both crime rates and areal characteristics and thus may pose serious problems in a linear regression

TABLE 1. MEANS, MEDIANS, AND SKEWNESS FOR CENSUS TRACT VARIABLES IN ORIGINAL METRICS AND LOGARITHM TRANSFORMATIONS

Ecological Characteristics	Original Metric			Natural Logarithms		
	Mean	Median	Skewness	Mean	Median	Skewness
1950						
Targets	.471	.260	1.931	.340	.228	1.238
% Comm.-Ind.	28.129	19.450	1.211	2.849	3.014	-1.103
Res. vs. Mfg.	-.089	-.029	-.710	--	--	--
% Res. Vacancy	6.546	.900	3.734	.994	.642	3.145
Housing Score	.046	.175	-.490	--	--	--
% Units Black	1.456	.129	1.285	.609	.121	.822
1960						
Targets	.490	.255	2.761	.343	.227	1.936
% Comm.-Ind.	28.714	19.900	1.319	3.112	3.039	-.126
Res. vs. Mfg.	-.001	-.032	-1.188	--	--	--
% Res. Vacancy	3.340	3.415	1.799	1.352	1.485	.023
Housing Score	-.082	.149	-.609	--	--	--
% Units Black	4.220	.218	1.774	.874	.198	1.305
1970						
Targets	.362	.215	1.506	.290	.195	1.180
% Comm.-Ind.	26.857	20.850	1.424	3.093	3.086	.183
Res. vs. Mfg.	-.052	.086	-1.797	--	--	--
% Res. Vacancy	4.119	2.065	1.126	1.455	1.121	.684
Housing Score	-.246	-.101	-.683	--	--	--
% Units Black	9.280	.927	2.011	1.443	.656	.903
Arrest Rates						
1966	3.980	1.732	1.766	1.372	1.004	1.088
1969	5.914	2.712	2.335	1.638	1.316	.871
1970	6.850	2.870	2.568	1.698	1.358	1.068
1974	7.978	4.321	1.844	1.904	1.676	.771
1975	8.224	3.966	1.642	1.947	1.603	.814
1978	5.074	2.968	1.636	1.626	1.379	1.001
Offense Rates						
1970	12.624	5.600	3.612	2.095	1.887	2.018
1974	19.769	7.765	3.622	2.399	2.171	1.734
1975	18.792	8.404	3.586	2.448	2.240	1.643
1978	15.766	6.438	3.580	2.284	2.007	1.725

analysis. Inspection of scattergrams and residuals from various regression runs confirmed the presence of heteroscedasticity. One approach dealing with this problem is the use of ratio variables in which the denominator is the population of the area (e.g., the population of the census tract). Since most of our data are already in this form we will consider the use of logarithmic transformations to deal with this issue.

The third procedure, the measurement of change, is a major issue which involves reliably measuring changes while accounting for the components of change, that is, the variables which are used to compute the change scores. For example, if we wish to assess the effects of change in targets on the crime rate it is necessary to account for the area's initial target level. One of the reasons for this is the phenomenon of regression to the mean. Although there are several procedures for dealing with this problem in analyzing change, one method in the context of regression analysis is simply to enter a term into the regression equation for the initial level.

As already mentioned, Table 1 presents data on the degree of skewness present in the data for census tracts (the data for police grids are very similar and are not presented). This table also contains information on the results of a logarithmic transformation of the variables.[1] The degree of skewness is reduced in every case, substantially so in a few instances; it is our judgement that this transformation results in a satisfactory reduction in the degree of skewness.

Table 2 presents the results of three approaches to the regression analysis of the 1966 and 1969 arrest rates for the census tracts.[2] The first approach involved the use of all census tracts in the usual linear regression analysis. The second approach excluded Tract 1, an outlier, and repeated the linear regression analysis. The third approach involved using the log transformations with Tract 1 included. Thus the results in row 3, for example, represent a "log-log" equation in all instances except where the independent variable is the housing score or the land use score, in which case they represent "semi-log" equations.

In general, the data show that the presence of the outlier in the linear regression analysis results in an inflation of the metric and standardized coefficients. This means that predicted scores based on the metric coefficients and inferences concerning the strengths of the relationships based on the standardized coefficients will be different depending on whether or not the outlier is included. Since an outlier is by definition atypical of the general data pattern, such inferences will be misleading with respect to the general nature of the relationship.

The use of the log transformations with the retention of the outlier is a more satisfactory solution because it helps maintain degrees of freedom which is important with a small number of cases and reduces the impact of the outlier on the strength of the relationship. It should also be noted that there are some instances where the strength of the relationship increases when

TABLE 2. REGRESSION ANALYSES OF 1966 AND 1969 ARREST RATES: CENSUS TRACTS (N=14)

Independent Variables		Dependent Variables					
		1966 Arrest Rate			1969 Arrest Rate		
		b	β	$\bar{R}^2$	b	β	$\bar{R}^2$
1950							
Targets	(1)	7.43	.94*	.88	12.12	.95*	.89
	(2)	7.64	.86*	.71	9.47	.84*	.69
	(3)	1.92	.88*	.75	2.13	.86*	.72
% Comm.-Ind.	(1)	.15	.90*	.80	.24	.89*	.78
	(2)	.12	.79*	.60	.15	.78*	.58
	(3)	.29	.58*	.28	.33	.57*	.27
Res. vs. Mfg.	(1)	-1.62	-.18	.00	-2.21	-.15	.00
	(2)	-.41	-.07	.00	.06	.01	.00
	(3)	-.23	-.16	.00	-.16	-.10	.00
% Res. Vacancy	(1)	-.02	-.10	.00	-.02	-.05	.00
	(2)	-.01	-.05	.00	.01	.05	.00
	(3)	-.12	-.19	.00	-.09	-.12	.00
Housing Score	(1)	-5.06	-.84*	.69	-7.58	-.78*	.58
	(2)	-3.74	-.83*	.66	-4.59	-.81*	.62
	(3)	-.83	-.86*	.71	-.89	-.82*	.65
% Units Black	(1)	1.08	.55*	.24	1.51	.48	.16
	(2)	.77	.58*	.27	.91	.55	.24
	(3)	.58	.66*	.39	.64	.65*	.37
1960							
Targets	(1)	6.09	.93*	.85	10.27	.97*	.93
	(2)	9.35	.89*	.77	11.60	.88*	.74
	(3)	1.84	.89*	.77	2.07	.88*	.76
% Comm.-Ind.	(1)	.17	.96*	.91	.26	.93*	.85
	(2)	.15	.91*	.82	.18	.90*	.78
	(3)	.67	.82*	.64	.75	.80*	.61
Res. vs. Mfg.	(1)	-5.84	-.60*	.31	-8.36	-.53	.23
	(2)	-4.05	-.61*	.32	-4.85	-.58*	.28
	(3)	-1.04	-.67*	.40	-1.15	-.66*	.38
% Res. Vacancy	(1)	1.39	.78*	.58	2.37	.83*	.66
	(2)	.90	.43	.12	1.05	.40	.09
	(3)	.77	.58*	.28	.85	.57*	.27
Housing Score	(1)	-4.43	-.89*	.78	-6.79	-.85*	.69
	(2)	-3.39	-.87*	.74	-4.30	-.88*	.75
	(3)	-.74	-.93*	.85	-.81	-.90*	.79
% Units Black	(1)	.16	.30	.01	.18	.21	.00
	(2)	.19	.53	.22	.23	.52	.20
	(3)	.29	.51	.20	.33	.52	.21

Note: Row 1 results are from linear regression with Tract 1 included; Row 2 results are from linear regression with Tract 1 excluded; Row 3 results are from regression with all variables except housing score and res. vs. mfg. in natural log form and Tract 1 included.

b = metric regression coefficient; β = standardized regression coefficient; $\bar{R}^2$ = R^2 adjusted for degrees of freedom; * $p < .05$

the log transformations are used (e.g., the results for the effect of percent units Black occupied on the 1966 arrest rate). This suggests that the observed heteroscedasticity may have been producing inconsistent estimates of the regression coefficients. In short, while none of the various methods produces dramatically different results, the use of the log transformations best serves our purposes for the prediction equations in this chapter.

Table 3 presents the results of a similar approach to the analysis of change. The first two rows present the results of a linear regression of change on change in tract characteristics with and without Tract 1, respectively. The log transformations are again employed in rows 3 and 4. In row 3 the initial position on the arrest rate is held constant and in row 4 both the initial arrest rate and the initial characteristics are held constant. For example, where 1950 to 1960 change in targets is the independent variable, row 3 represents its effect on 1966 to 1969 arrest rate change when the 1966 arrest rate is held constant, and row 4 shows its effect when 1950 targets is also held constant. The purpose of this procedure is to overcome such problems as regression to the mean, as mentioned before.

In general, the results show no strong effects of change regardless of the method. However, it does appear that both linear models (rows 1 and 2) may produce misleading or inconsistent results. The two methods using log transformations generally do not produce very different results although there is some indication that multicollinearity may result in

TABLE 3. REGRESSION ANALYSIS OF CHANGE IN ARREST RATES FOR CENSUS TRACTS (N=14)

Independent Variables		Dependent Variable			Independent Variables		Dependent Variable		
		1966-69 Arrest Rate Change					1966-69 Arrest Rate Change		
1950-60		b	β	$\bar{R}^2$	1960-70		b	β	$\bar{R}^2$
Targets	(1)	12.68	.77*	.56	Targets	(1)	-6.79	-.91*	.82
	(2)	-2.97	-.25	.00		(2)	-1.88	-.23	.00
	(3)	.39	.16	.00		(3)	-.04	-.03	.00
	(4)	.45	.19	.00		(4)	.47	.40	.00
% Comm. - Ind.	(1)	-.10	-.22	.00	% Comm. - Ind.	(1)	-.32	-.43	.12
	(2)	.02	.11	.00		(2)	-.06	-.21	.00
	(3)	.00	.01	.00		(3)	-.07	-.07	.00
	(4)	.05	.22	.00		(4)	-.05	-.05	.00
Res. vs. Mfg.	(1)	-1.48	-.25	.00	Res. vs. Mfg.	(1)	9.58	.39	.08
	(2)	-1.01	-.48	.17		(2)	3.86	.43	.12
	(3)	-.10	-.27	.04		(3)	1.04	.64*	.46
	(4)	-.08	-.20	.00		(4)	1.09	.68*	.43
% Res. Vacancy	(1)	.01	.07	.00	% Res. Vacancy	(1)	.03	.03	.00
	(2)	-.01	-.28	.00		(2)	.25	.70*	.44
	(3)	-.03	-.20	.01		(3)	-.01	-.03	.00
	(4)	.19	1.46	.07		(4)	-.01	-.03	.00
Housing Score	(1)	-4.17	-.49	.17	Housing Score	(1)	-3.33	-.19	.00
	(2)	-1.46	-.45	.13		(2)	1.38	.22	.00
	(3)	-.08	-.14	.00		(3)	-.43	-.38	.13
	(4)	-.05	-.09	.00		(4)	-.43	-.38	.05
% Units Black	(1)	-.01	-.05	.00	% Units Black	(1)	.02	.07	.00
	(2)	.06	.34	.04		(2)	.03	.29	.00
	(3)	.04	.15	.00		(3)	-.16	-.50	.20
	(4)	.05	.17	.00		(4)	-.16	-.50	.13

Note: Row 1 results are from linear regression with Tract 1 included; Row 2 results are from linear regression with Tract 1 excluded; Row 3 results are from regression analyses based on log transformations and with earlier crime rate held constant; Row 4 is same as Row 3 but the earlier ecological variable is also held constant.

b = metric regression coefficient; β = standardized regression coefficient; $\bar{R}^2 = R^2$ adjusted for degrees of freedom; * $p < .05$

unsatisfactory estimates of the regression coefficients (e.g., the standardized coefficient for the 1950 to 1960 change in percent residential vacancies). The method represented by the results in row 3 is the best choice in our judgement. The change variables are differences in transformed variables and therefore avoid problems of skewness and the initial arrest rate is held contact constant therefore "residualizing" the dependent variable. Although the initial level of the independent variable is not held constant, the differences between rows 3 and 4 suggest that this may not produce misleading results in the majority of cases while it does avoid problems of multicollinearity.

FOOTNOTES

[1] The actual transformation involved taking the natural logarithm of the variables plus one to avoid taking logs of numbers less than one. In addition, we opted not to transform the housing and the land use scores since they do not exhibit a high degree of skewness and would have required rescaling.

[2] We have performed similar comparisons for all of the other analyses which we will later discuss but omit them here for the sake of brevity. The general approach discussed here is based on Robert W. Jackman, "A Note on the Measurement of Growth Rates in Cross-National Research," American Journal of Sociology, Vol. 86, November 1980, pp. 604-617.

APPENDIX H

THE CHANGING SPATIAL PATTERN OF POLICE CONTACTS FOR THREE BIRTH COHORTS

INTRODUCTION

In this appendix we compare the same measures of delinquency and crime, i.e., official police records, for the three birth cohorts as they are distributed within each of the four spatial systems. Change in the spatial distribution of police contacts from cohort to cohort will be shown by a series of maps for each of the spatial systems.

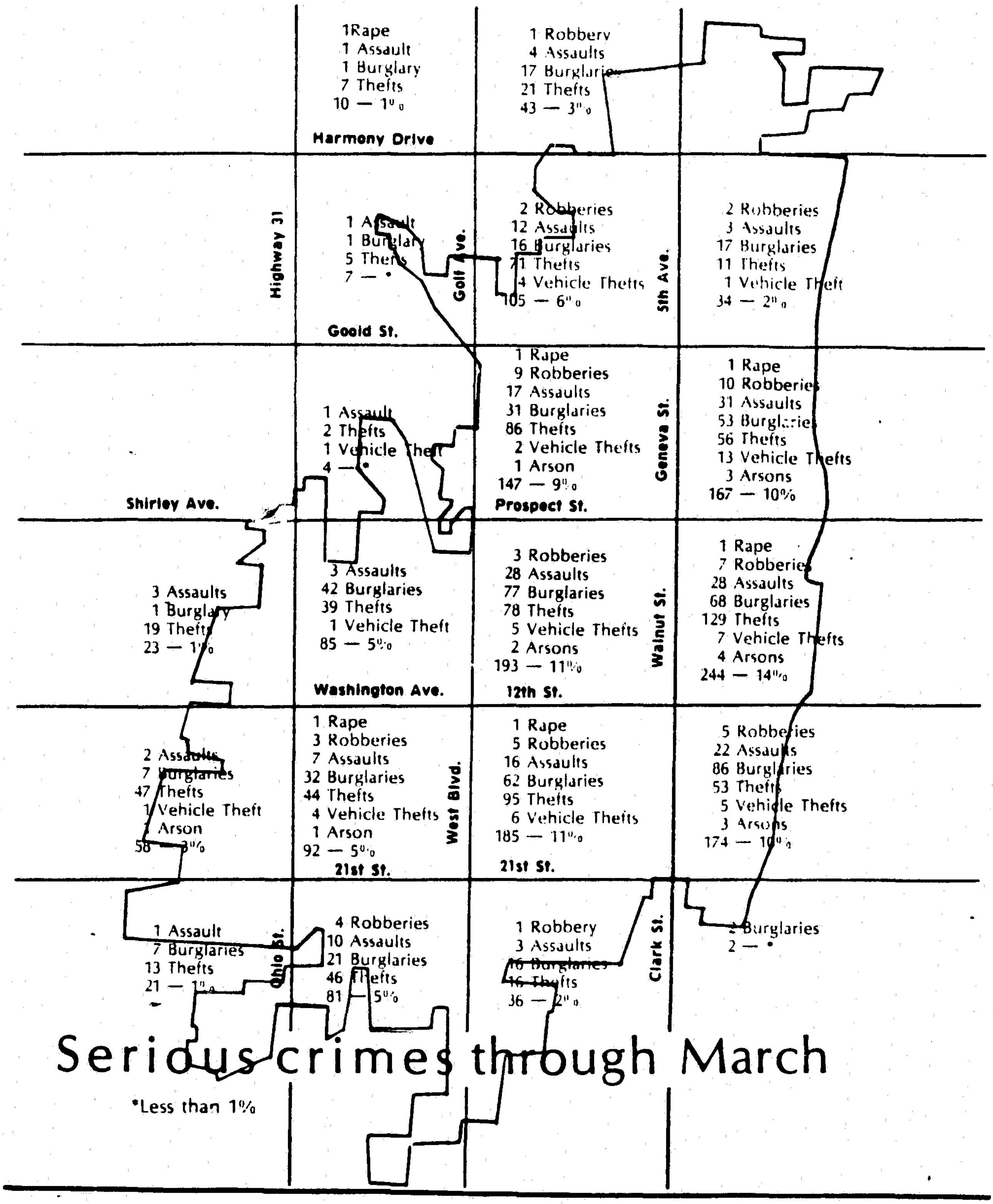
Each month the Racine Journal-Times printed a map showing how many Part I Offenses took place in each police grid area with a lag of one month (example on the following page). Our conversations with people over the years indicate that areas with frequent offenses such as larceny, burglary, robbery, and assault are perceived by many people as dangerous shoals to be avoided while to others they carry all of the challenge of the thundering surf which must be passed through before reaching snug harbor.[1] Whether long time residents peruse these maps avidly enough to identify patterns of change in the spatial distribution of delinquency and crime is another question.

THE CHANGING RELATIONSHIP OF NUMBER OF OFFENSES AND RATES IN NATURAL AREAS TO POLICE GRID AREAS

Several different kinds of maps are presented to show how patterns of offenses have changed from cohort to cohort. The first set was computer-contoured from cohort data by natural

Burglary tops rising crime rate

the Journal Times
Friday, June 5, 1981
B



Serious crimes through March

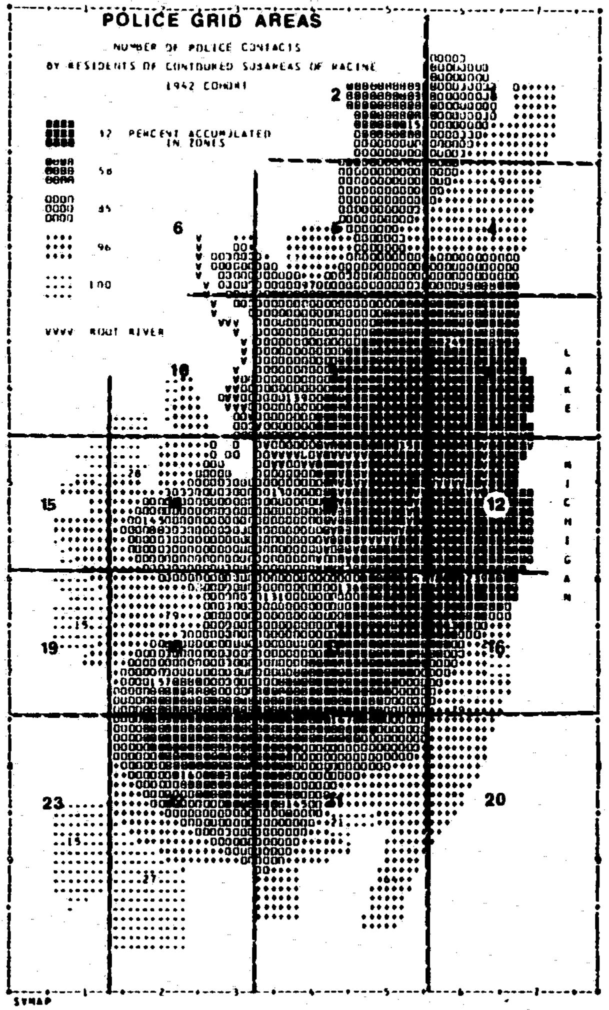
*Less than 1%

areas for one of our earlier projects. These areas are presented here overlaid by police grid areas to show how the high incidence of police contacts by residents of the inner city and interstitial, relatively homogeneous natural areas (more homogeneous than police grid areas) are distributed throughout perhaps twice as many police grid areas as they would be if these areas had been designed to delineate high offense or police contact areas. Maps 1 through 6 show the distribution of contacts by place of residence and then by place of offense. Maps 1 through 3 reveal that, cohort by cohort, the inner city containing persons responsible for 30% of the police contacts has become smaller and smaller. Maps 4 through 6 show a similar increase in the concentration of police contacts by place of contact.

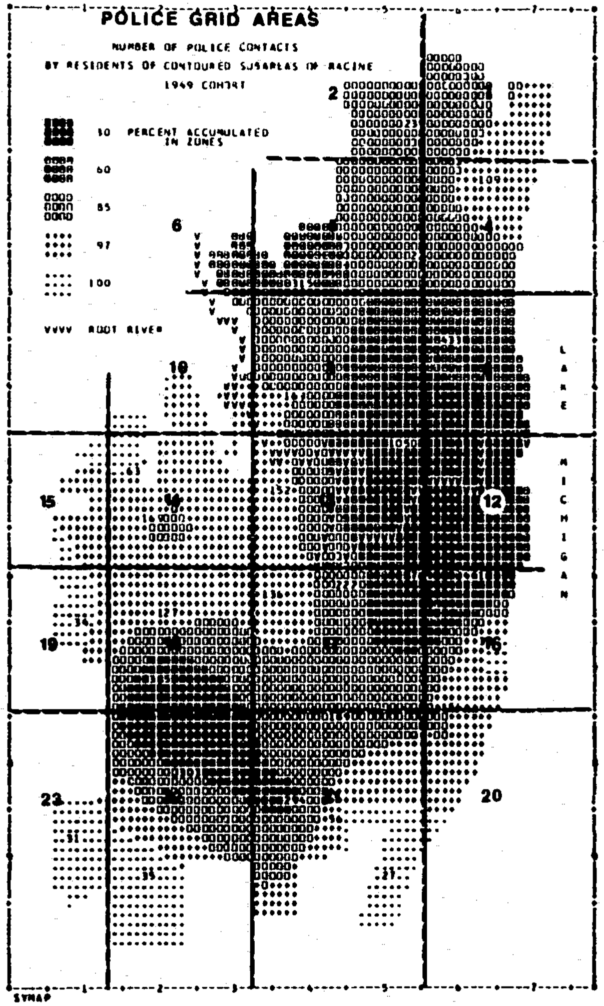
A set of maps (not included) based on average contacts per block by natural areas of residence at time of contact and then by place of contact revealed that the area of high police contact rates by place of residence increased in size as cohort rates increased from cohort to cohort. The size of the area with a high rate of police contacts by place of contact also increased from cohort to cohort at the same time that other areas with high rates of police contact developed.

Sheer numbers present a somewhat different picture from that of rates but regardless of the basis on which a map is constructed and the spatial system employed, cohort by cohort (and year by year) areas of high police contact by place of

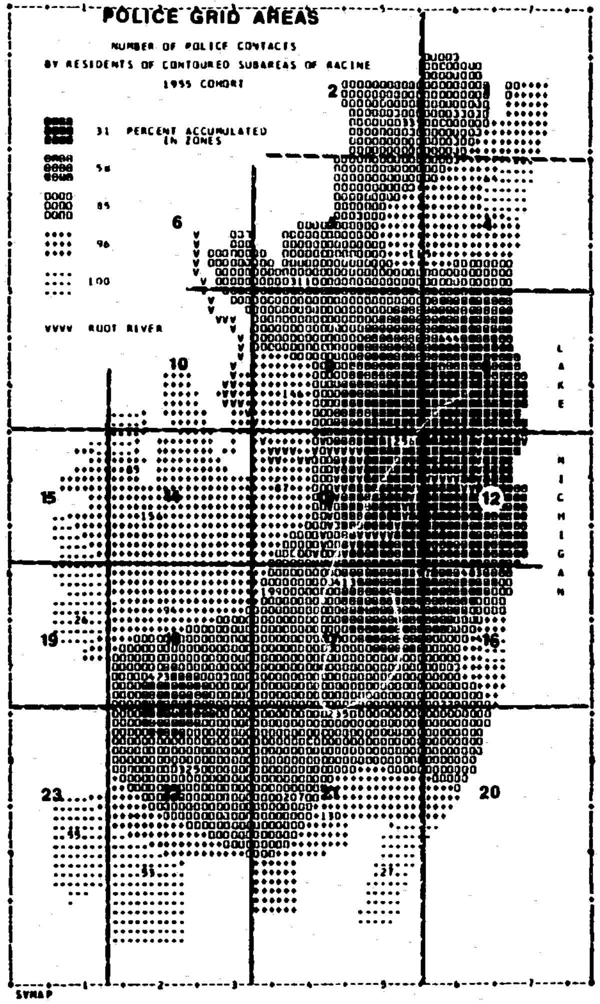
MAP 1



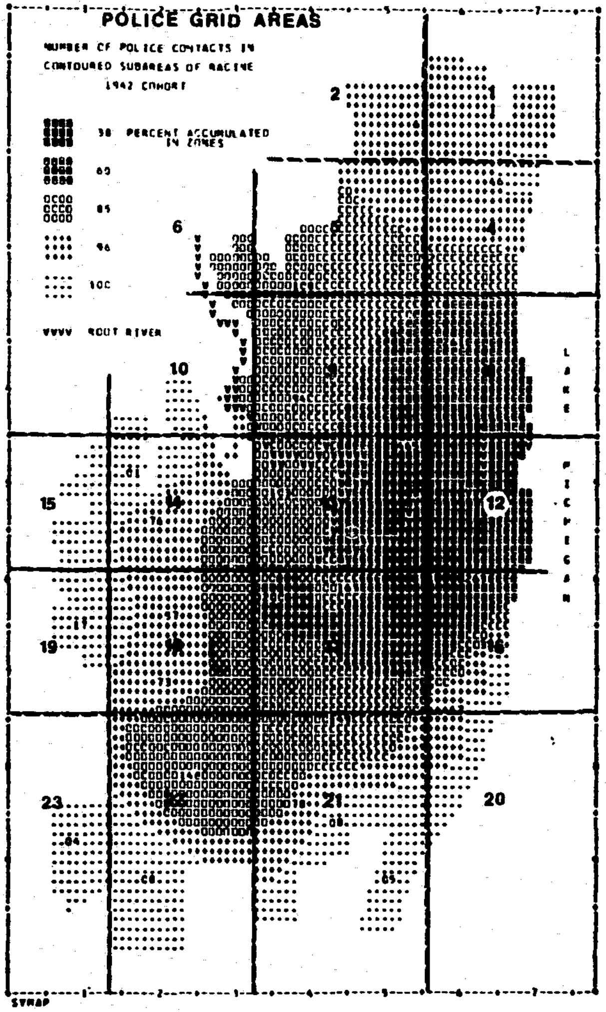
MAP 2



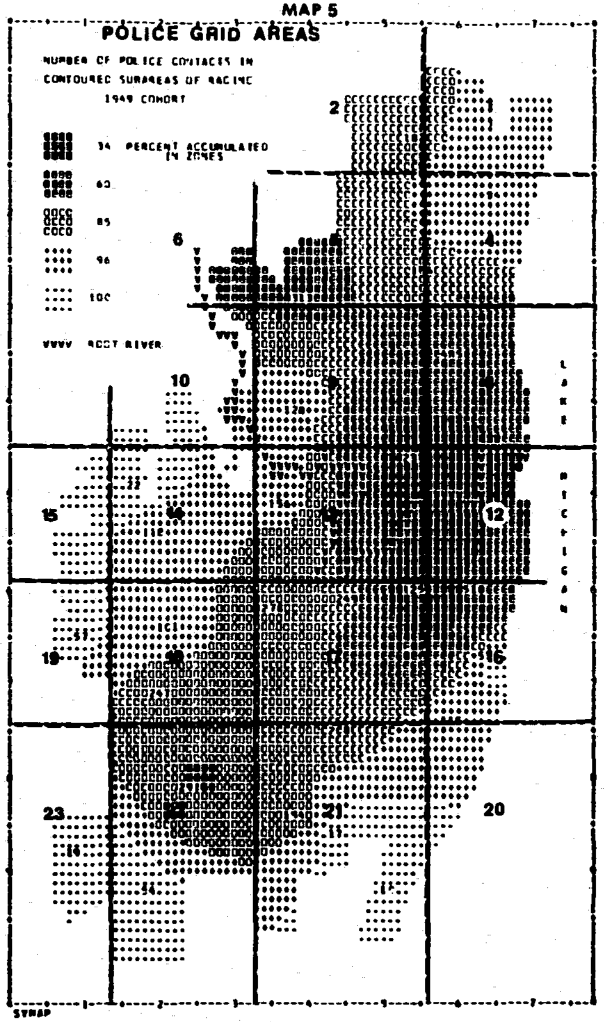
MAP 3



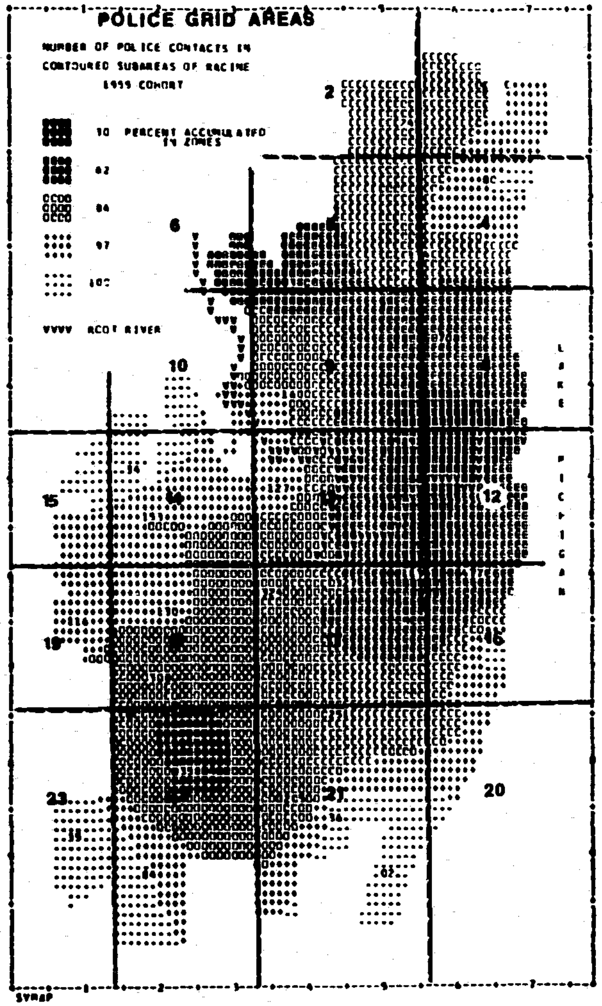
MAP 4



MAP 5



MAP 6



residence at time of contact or by area of contact expand while the inner city continues to harden as a center of delinquency and crime. Simultaneously, separate high contact areas appear which are unlinked to the large inner city and interstitial agglomeration. While these maps were based on all police contactsby cohort members, the picture that is presented is very similar to that which one would construct by examining the newspaper maps (Part I offenses) very carefully, month by month and year by year.

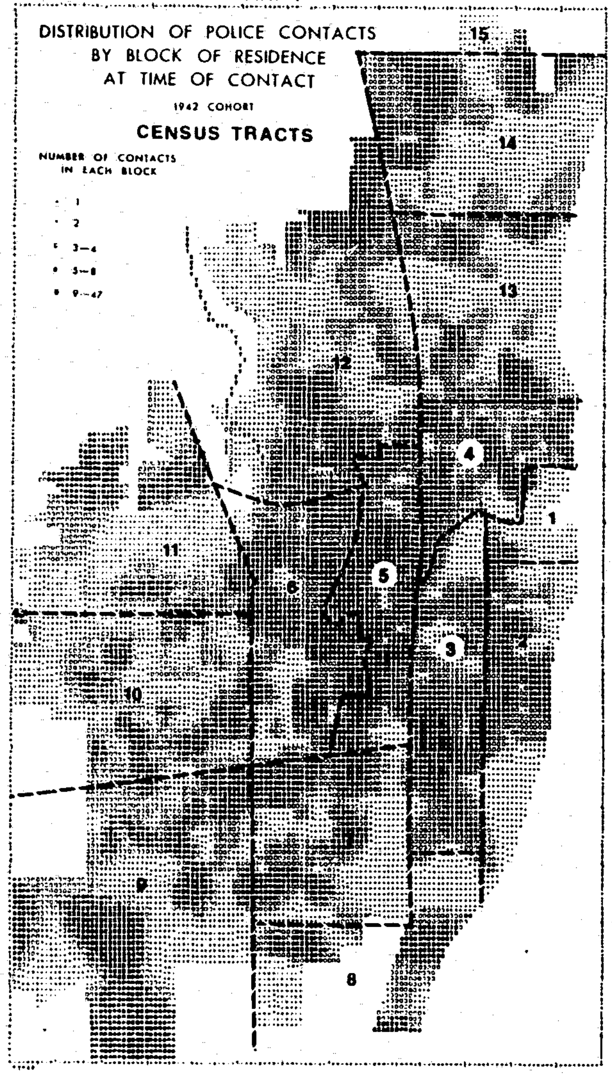
POLICE CONTACTS IN BLOCKS AND BY RESIDENTS OF BLOCKS BY COHORTS AND SPATIAL SYSTEMS

The first six maps are presented only as a starter. These were selected because the computer-contouring procedure smooths out the boundaries of natural areas so that patterns and changing patterns of police contacts are easy to discern. We were leading up to a far more precise set of maps in which the center of each block is given a value based on the number of police contacts by the residents of the block or by the number of contacts which took place there, cohort by cohort. Here we have a way of representing the distribution of contacts by place of residence of persons in the cohort at time of contact and by place of contact, block by block.

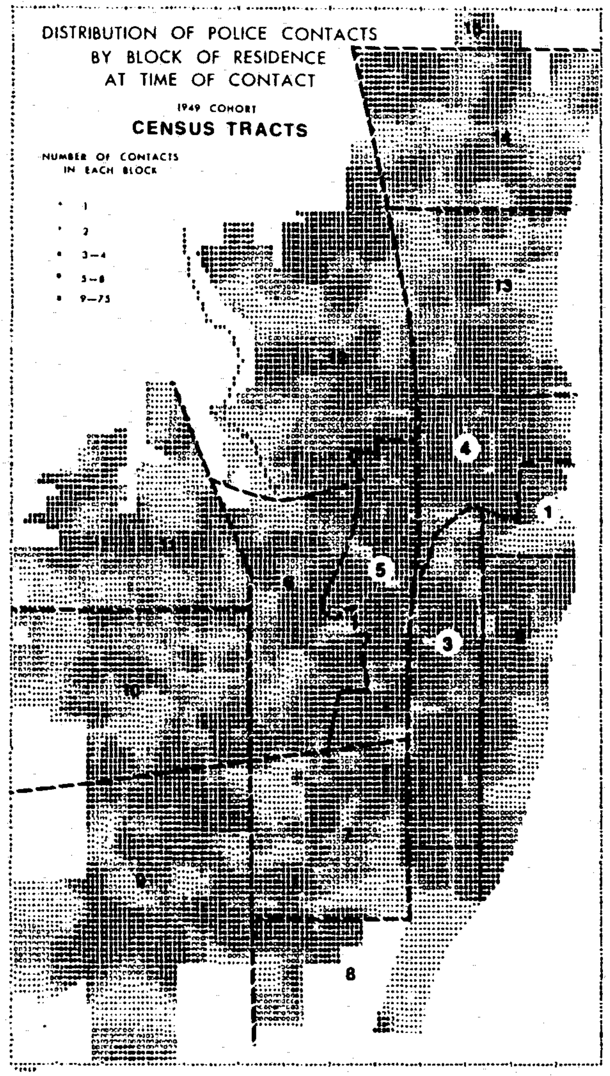
<u>Cohort Change by Census Tracts</u>

Maps 7 through 12 are overlaid with census tract outlines. Although these maps are not strictly comparable because of the different ages of the three cohorts it is obvious that numerous

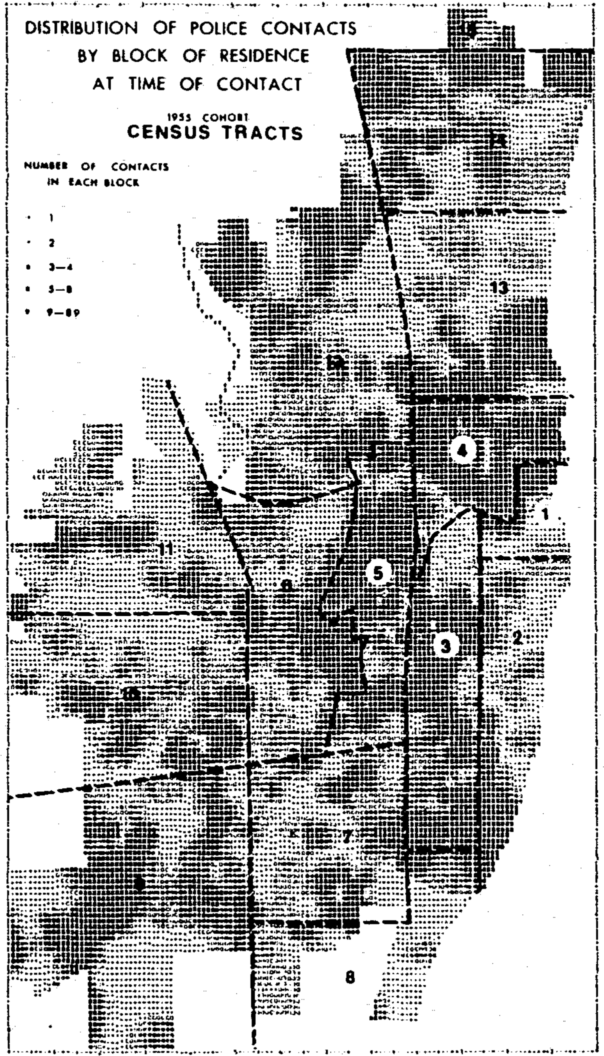
MAP 7



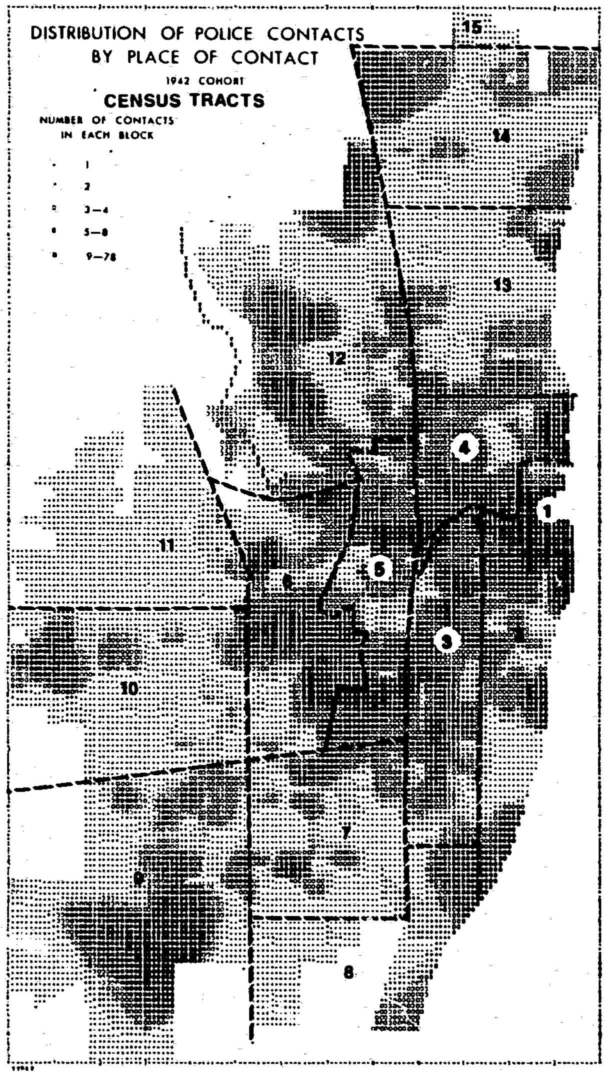
MAP 8



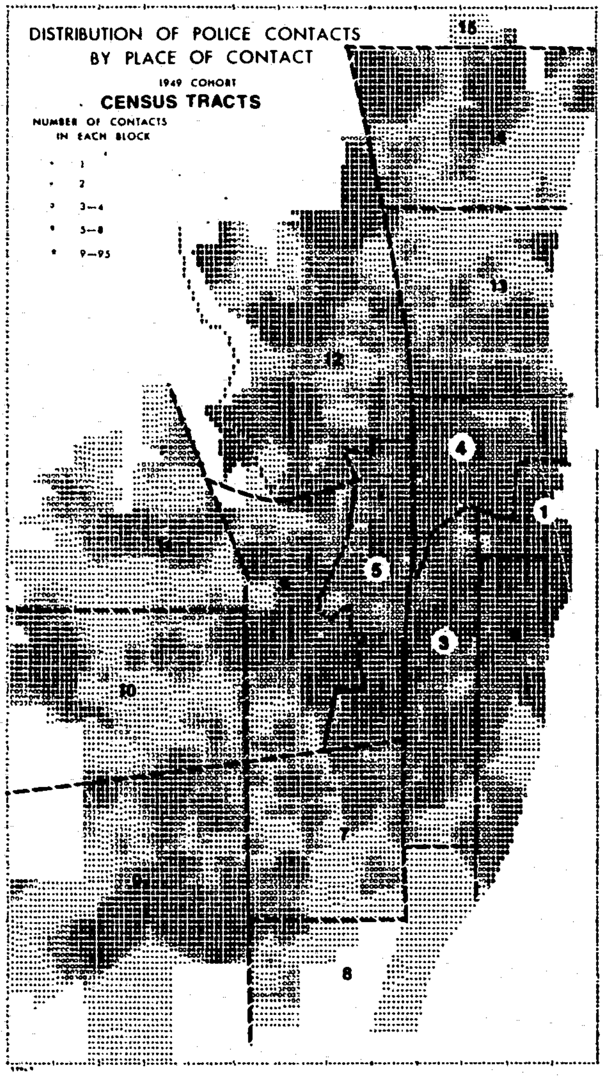
MAP 9



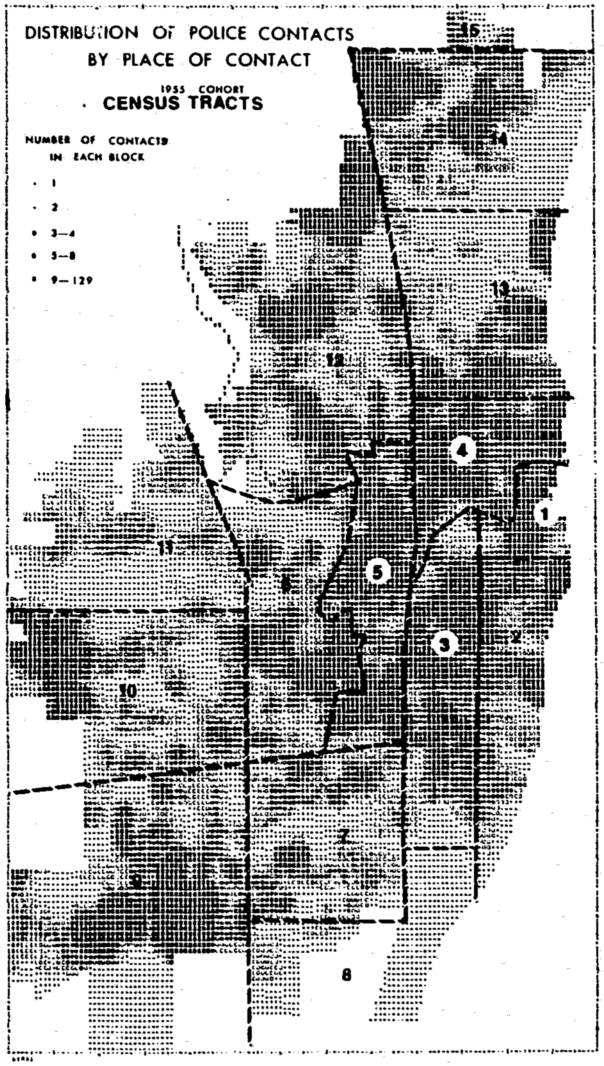
MAP 10



MAP 11



MAP 12



more peripheral areas of delinquency and crime have been developing at the same time that the inner city and interstitial areas of high delinquency and crime have been expanding. The sometimes wide divergence between an area as place of contact and place of residence for persons who had contacts is also brought out by comparing Maps 7 and 10, for example. For that matter, the more limited distribution of contacts by place of occurrence than by place of residence at time of contacts is apparent for each cohort.

What these maps show should be supplemented by a few statistics. First, in reference to the maps on police contacts by place of residence, 41.9% of the 1942 Cohort's police contacts were in only 11.9% of Racine's blocks. For the 1949 Cohort 11.5% of the blocks accounted for 43.3% of the contacts, and for the 1955 Cohort 11.9% of the blocks accounted for 49.3% of the contacts. These were the blocks whose cohort residents had 11 or more, 17 or more, and 21 or more contacts, cohort by cohort. In other words, persons with more frequent contacts residing in the same proportion of blocks were accounting for increasingly greater proportions of the police contacts, cohort by cohort. There is, of course, a certain amount of irregularity in the patterns shown even with computer-contouring because the cohorts are not distributed evenly throughout the city. This irregularity does not really present serious problems for ecological analysis because the cohort distributions are not significantly different from the population distribution for persons of their age when aggregated to spatial units.

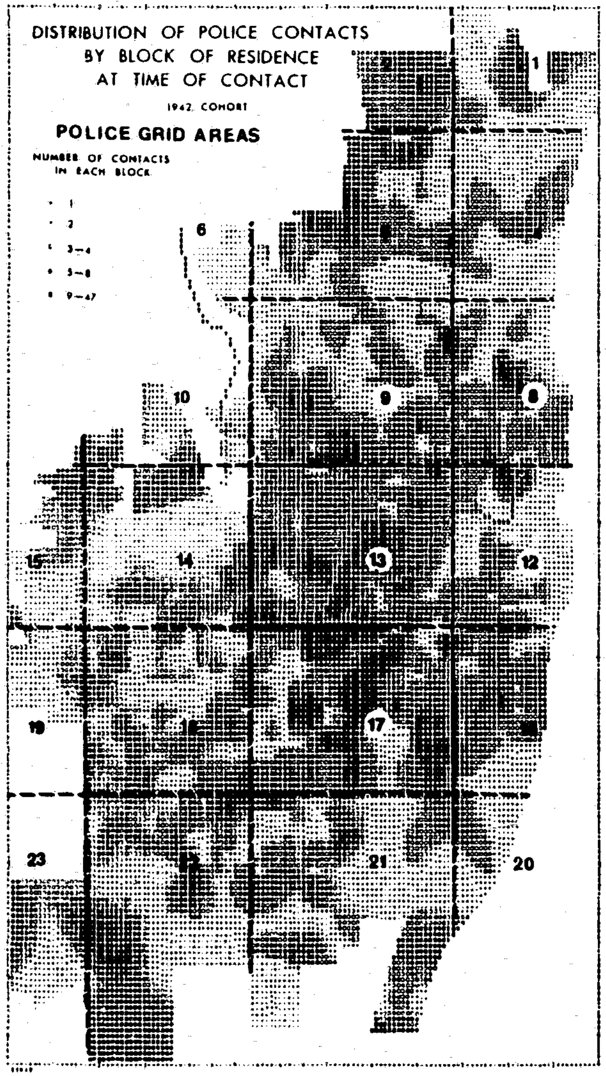
Turning to the maps on place of contact (Maps 10, 11, and 12) we find no increase in concentration by cohort with 12.9%, 11.9%, and 11.8% of the blocks containing 44.3% of the the 1942, 1949, and 1955 Cohorts' contacts, respectively. When that 5% of Racine's blocks containing the most contacts by place of contact or that 5% of the blocks whose residents had the most contacts were selected, the locations of high contact areas (26% to 28% of the contacts) and persons who generate a highly disproportional amount of the contacts (25% to 28% of the contacts) were even more sharply delineated.

Whichever way the contacts are considered, the heterogeneity of some census tracts (a matter to which we have frequently made reference) is also shown quite clearly. The fact that almost every block in three of the five inner city tracts had persons with numerous contacts, numerous persons with contacts, or was the location of frequent police contacts is also shown. But with few exceptions the homogeneity of census tracts ends there.

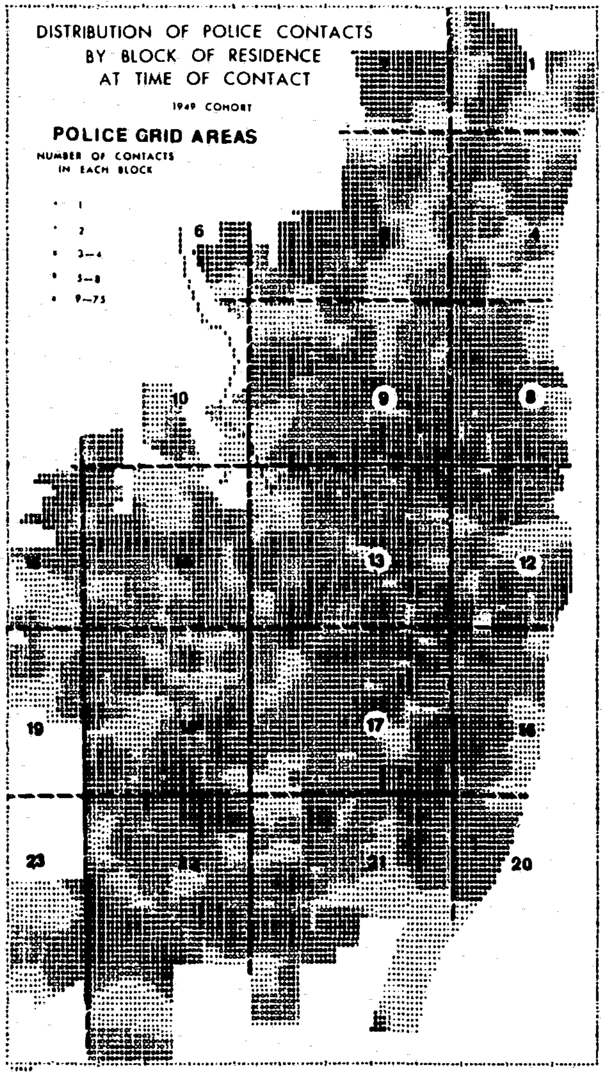
Cohort Change by Police Grid Areas

The next set of maps, Maps 13 through 18, presents the same block data overlaid for police grid areas. Differences in police grid areas as contributors to delinquency and crime by their residents and as areas which have attracted persons who have had police contacts as a consequence of the opportunities for interaction in the area are also readily seen, Grid Areas 14 and 19 being two interesting and opposite types. Police Grid Area 14 has relatively few in-grid contacts but residents of its built up

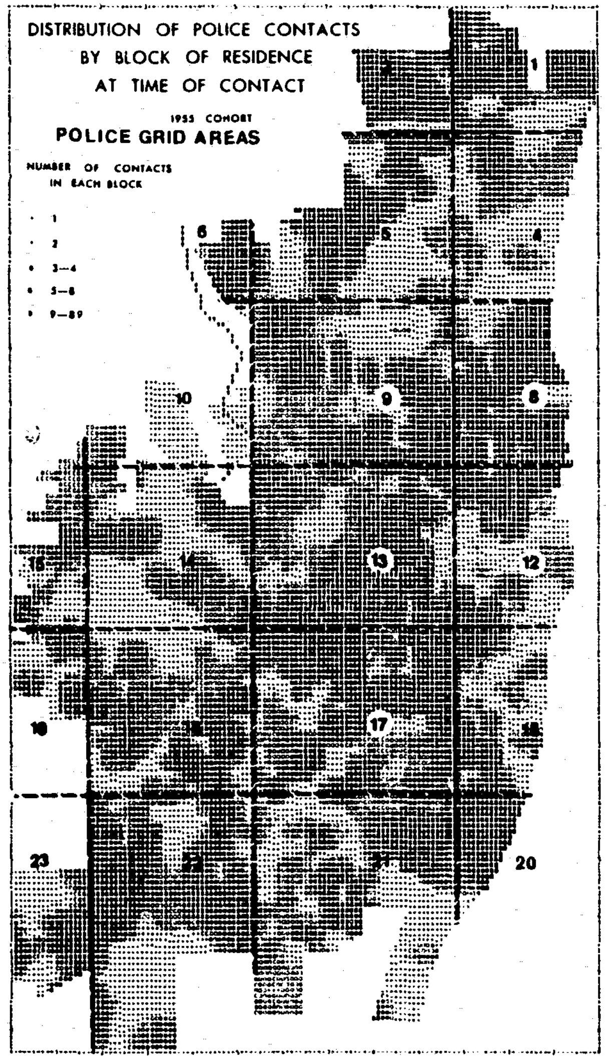
MAP 13



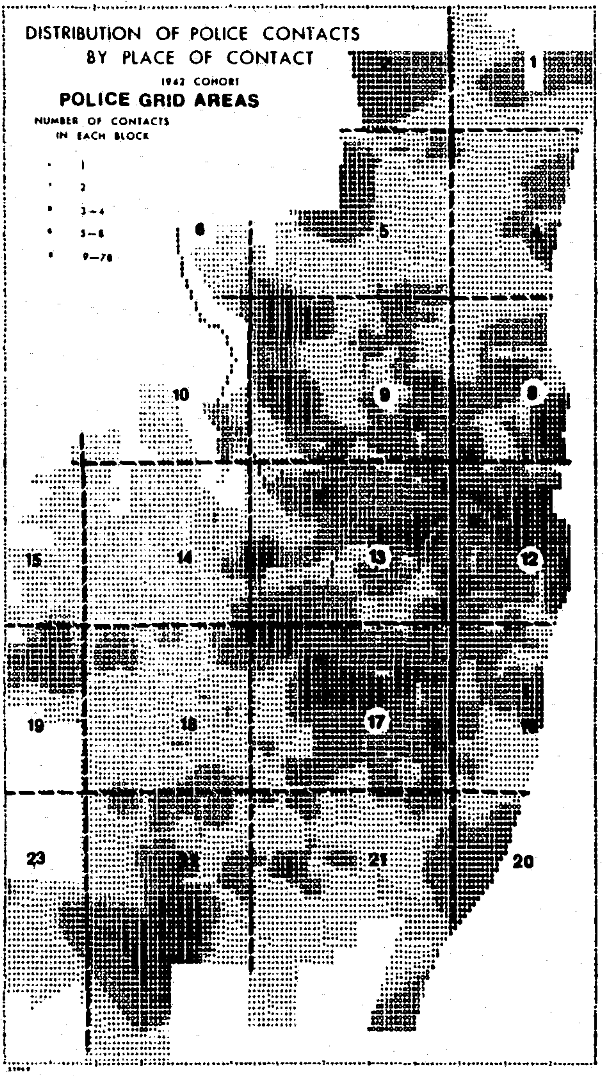
MAP 14



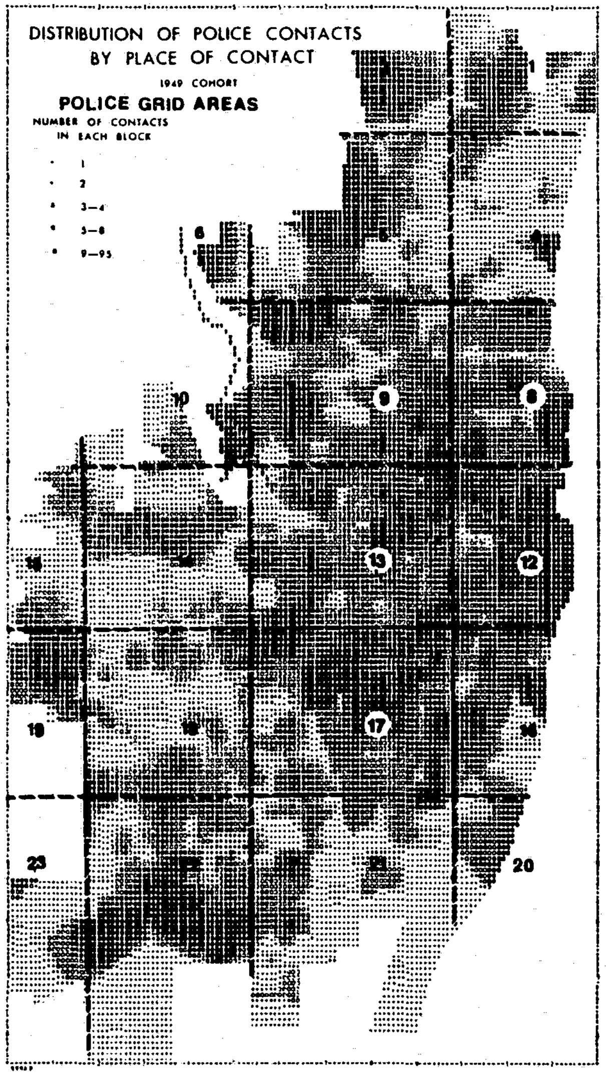
MAP 15



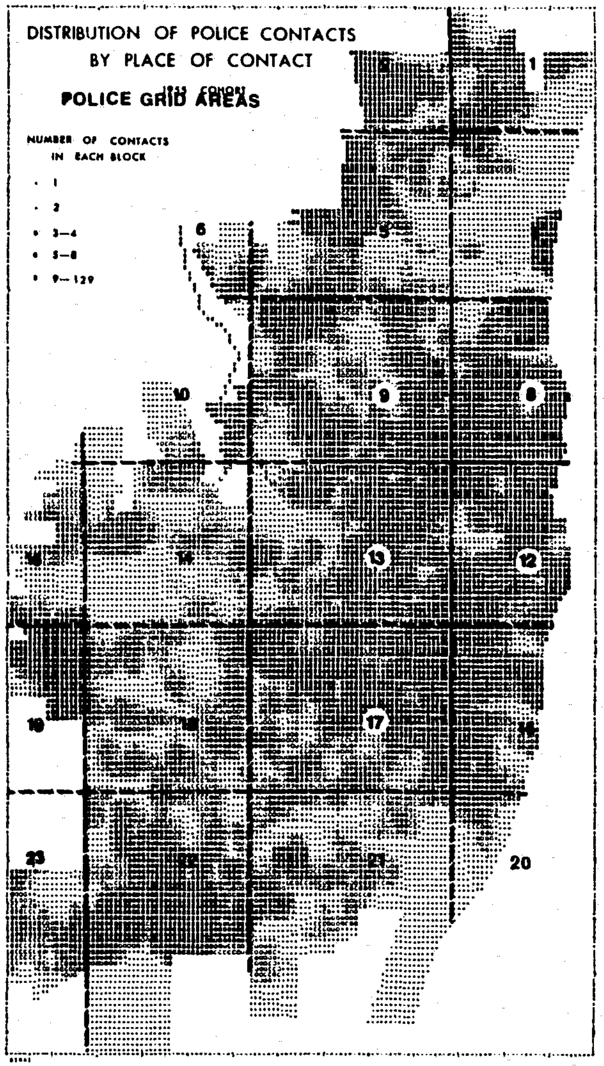
MAP 16



MAP 17



MAP 18

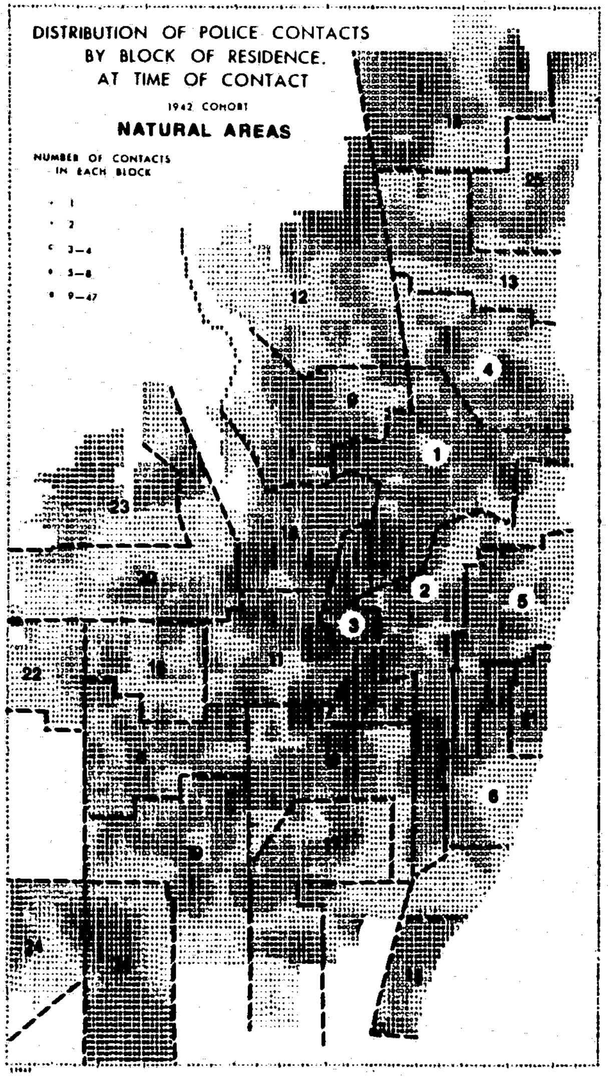


areas appear to have had police contacts, presumably in other areas of the community. In Grid Area 19 the built up portion seems to have generated police contacts but it had few cohort members and they had few contacts with the police. The relative heterogeneity of some police grid areas and the homogeneity of others is as apparent, if not more so, than it was for census tracts. That the Racine Journal-Times prints a map of offenses by place of occurrence rather than by place of residence of offender suggests (to those who peruse these maps carefully), a greater concentration of Part I Offenses than would be found were place of residence utilized as the locational variable.

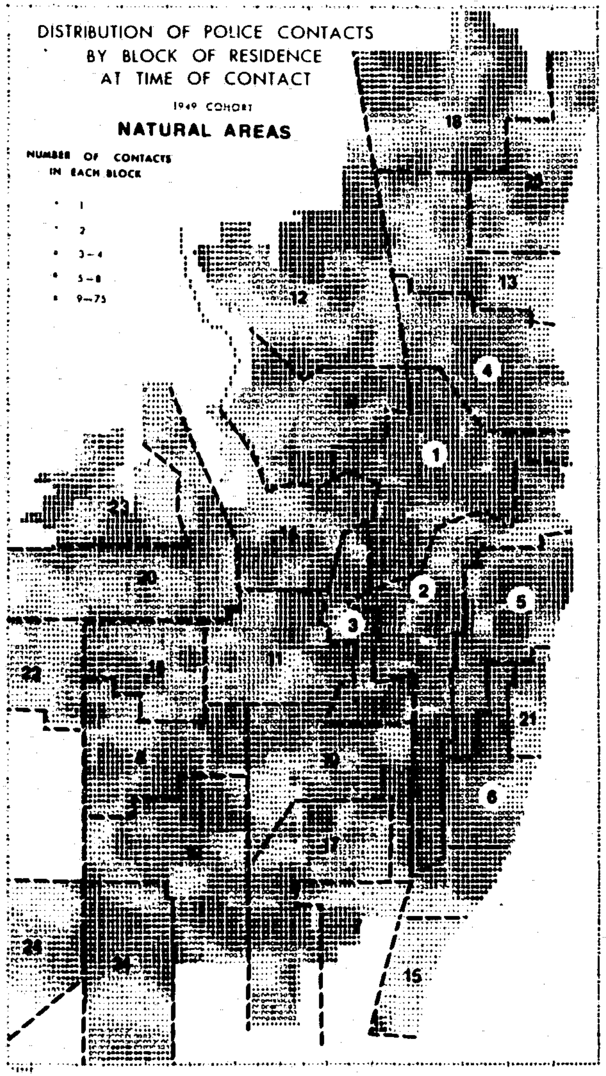
Cohort Change by Natural Areas

While some heterogeneity within natural areas is evident, Maps 19 through 24 do delineate high in-area and by-residents places more clearly than did either of the spatial systems with larger units. Some expansion of cohort police contacts by place of residence in the inner city and interstitial areas is very evident if one follows Natural Areas 4 and 6 from cohort to cohort, as is the development of areas whose residents have more frequent contacts such as in peripheral Natural Areas 12 and 18 (Maps 19 through 21). Similar changes by place of contact are seen in Maps 22 through 24. At the same time, it is obvious that had we commenced with the idea of delineating high police contact areas or high residence of offenders areas, the lines would have been drawn differently.

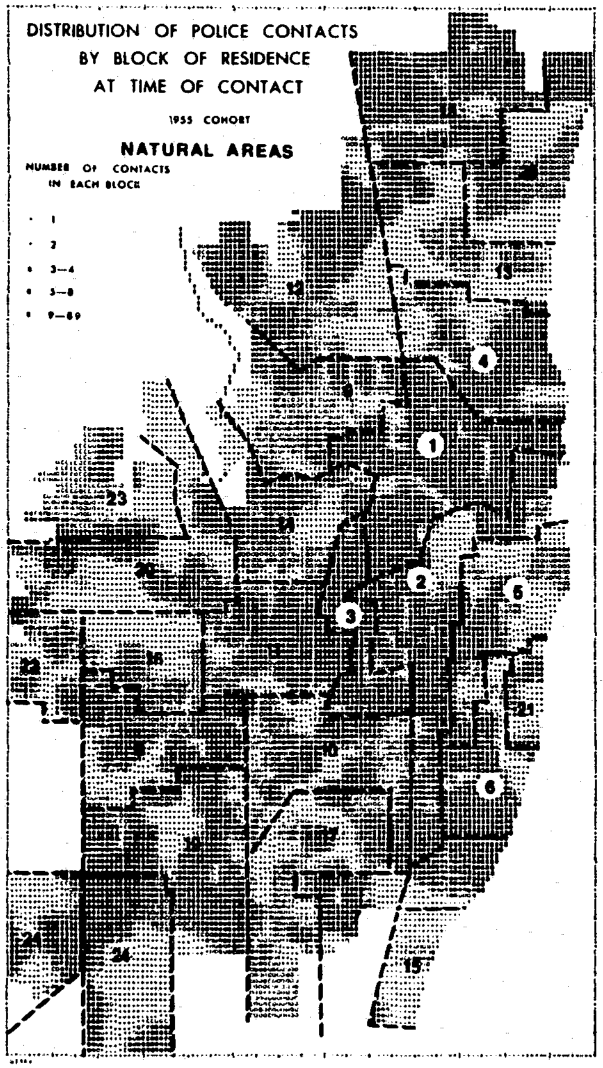
MAP 19



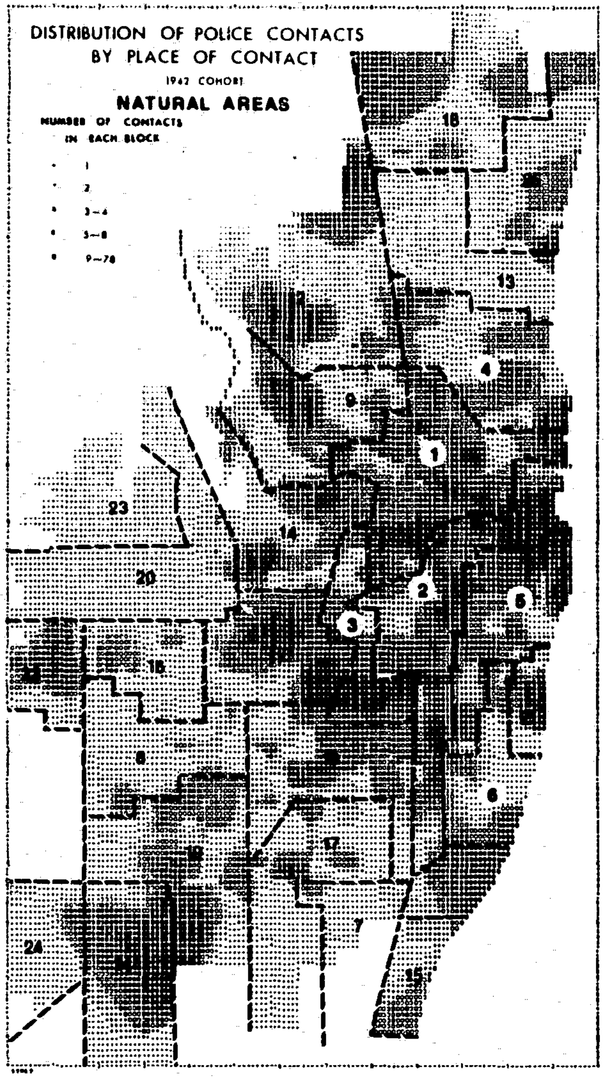
MAP 20



MAP 21



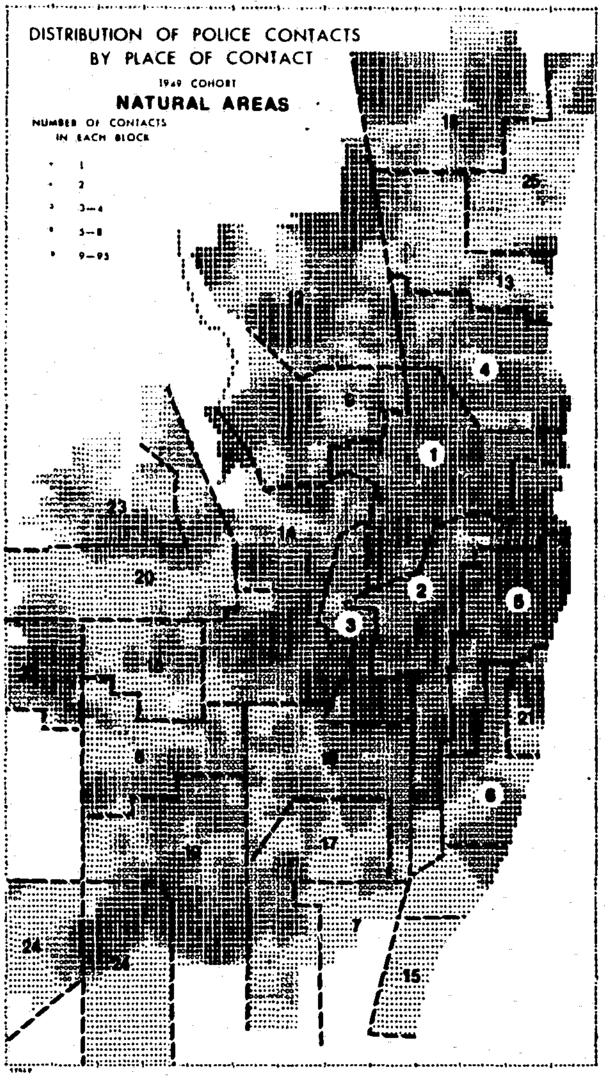
MAP 22


DISTRIBUTION OF POLICE CONTACTS BY PLACE OF CONTACT

1942 COHORT

NATURAL AREAS

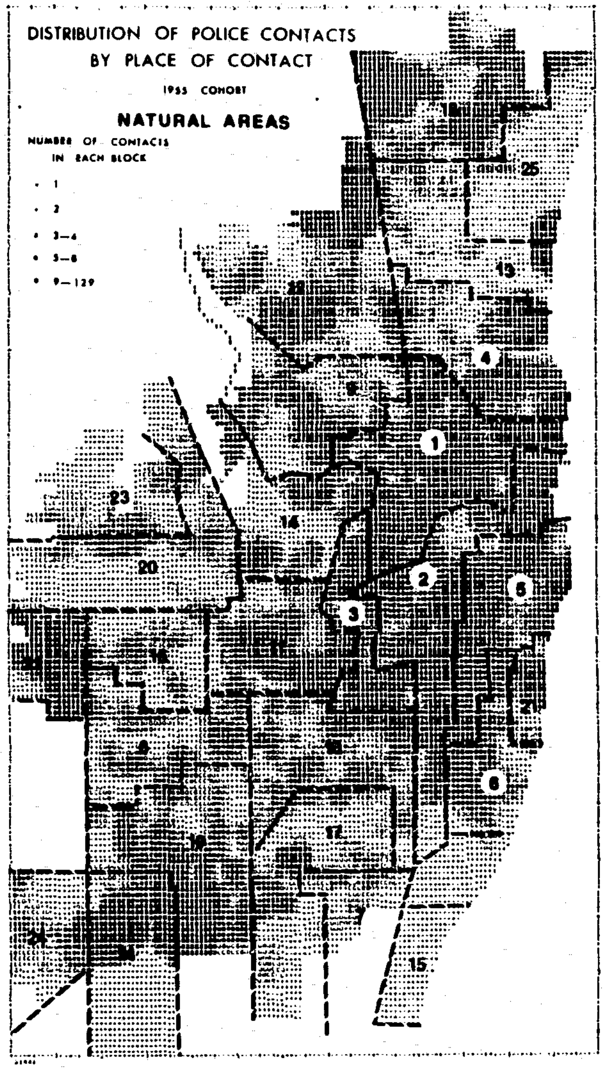
MAP 23


DISTRIBUTION OF POLICE CONTACTS BY PLACE OF CONTACT

1949 COHORT

NATURAL AREAS

MAP 24


DISTRIBUTION OF POLICE CONTACTS BY PLACE OF CONTACT

1955 COHORT

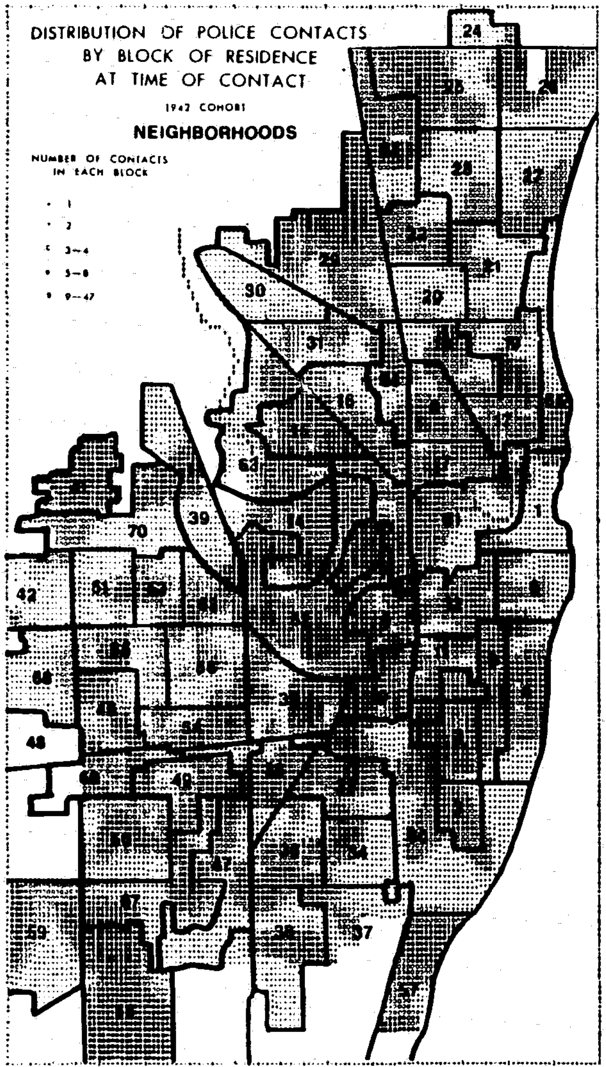
NATURAL AREAS

Cohort Change by Neighborhoods

The expansion of areas in which cohort members have had police contacts and the ever-expanding place of residence of those who have had contacts becomes even more evident as smaller units of spatial analysis are overlain on the block maps.[2]

Neighborhood outlines overlay the police contact data on Maps 25 through 30. Note that some of these neighborhoods are completely covered by the symbols indicative of a high number of offenses by residents of the block from one of the cohorts or of a high number of in-block offenses. There are, of course, numerous neighborhoods in which few, if any, police contacts have occurred, particularly for the 1942 Cohort (when police contacts were less numerous) and for the 1955 Cohort (for which fewer years of experience were recorded). There are, however, relatively fewer neighborhoods whose cohort residents have not had police contacts. But, even as carefully as the neighborhoods were delineated in an effort to achieve homogeneity, their boundaries in some cases fail to encapsulate areas which obviously harbor persons who account for sizeable proportions of the police contacts or are areas in which contacts frequently occur. As has been stated, however, the purpose was not to determine which areas had high offense rates but to visually present cohort change as delineated by each of the four spatial systems.

MAP 25



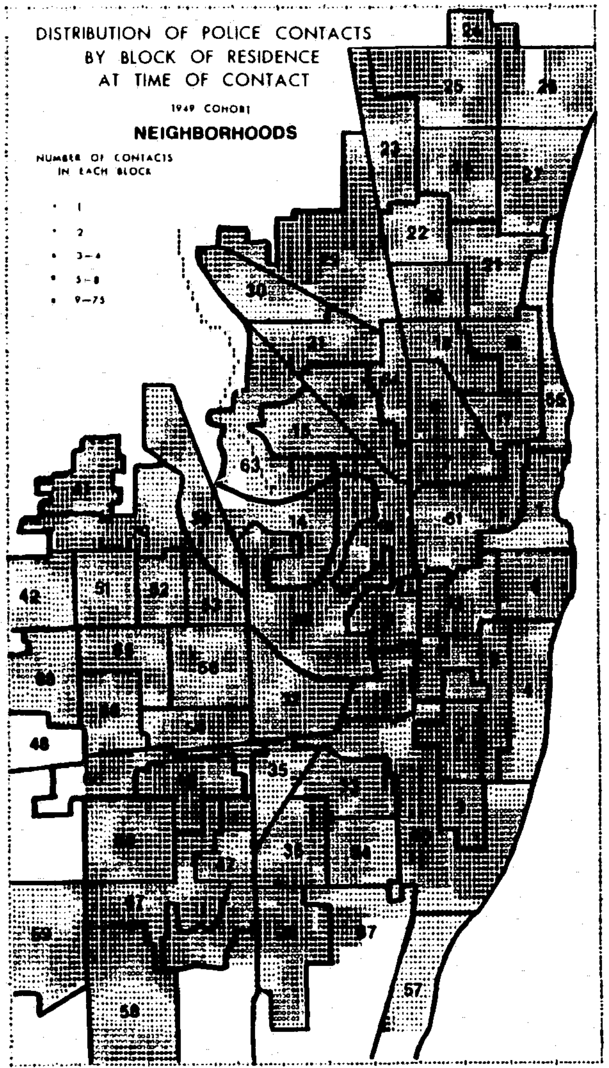
DISTRIBUTION OF POLICE CONTACTS BY BLOCK OF RESIDENCE AT TIME OF CONTACT

1942 COHORT

NEIGHBORHOODS

[illegible]

MAP 26



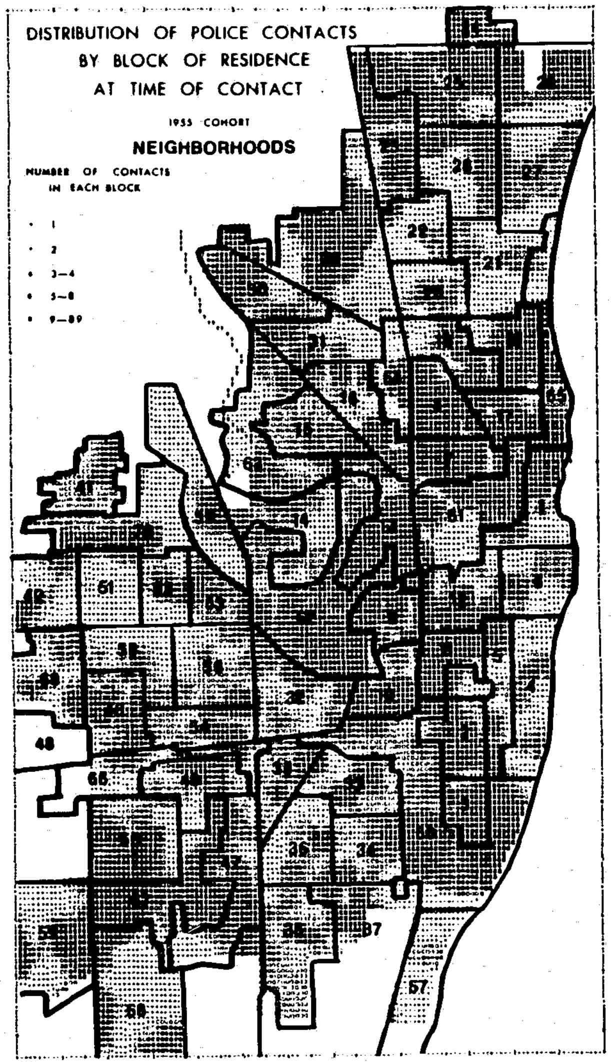
DISTRIBUTION OF POLICE CONTACTS BY BLOCK OF RESIDENCE AT TIME OF CONTACT

1949 COHORT

NEIGHBORHOODS

[illegible]

MAP 27



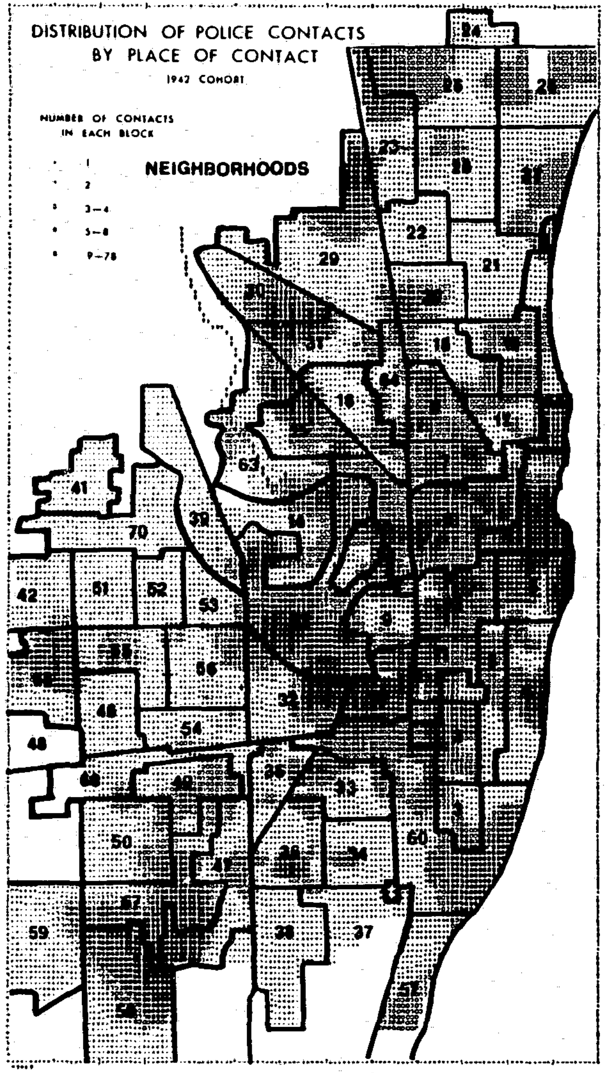
DISTRIBUTION OF POLICE CONTACTS BY BLOCK OF RESIDENCE AT TIME OF CONTACT

1955 COHORT

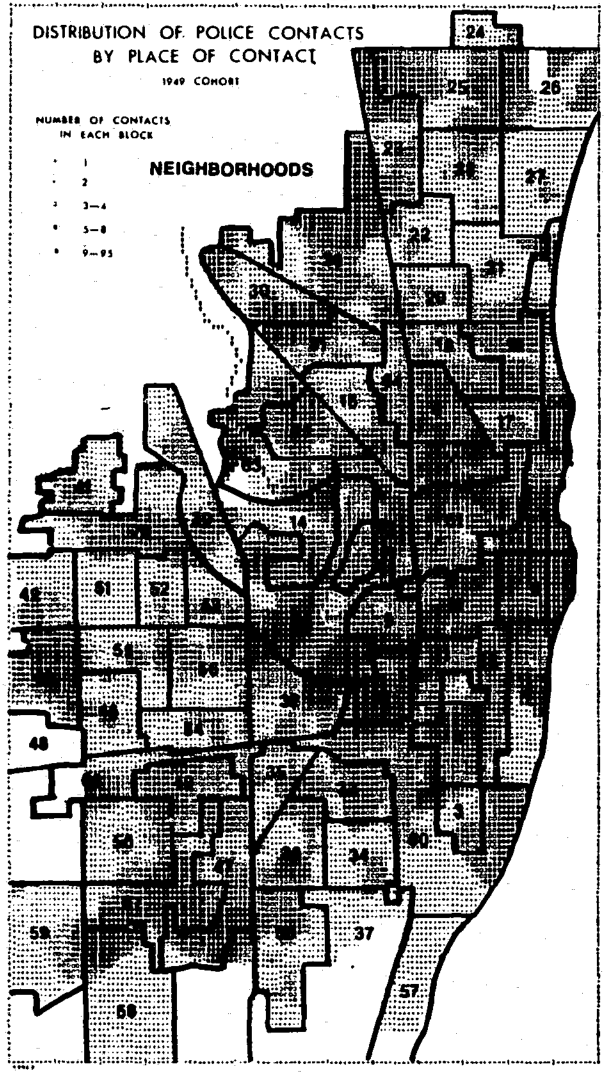
NEIGHBORHOODS

[illegible]

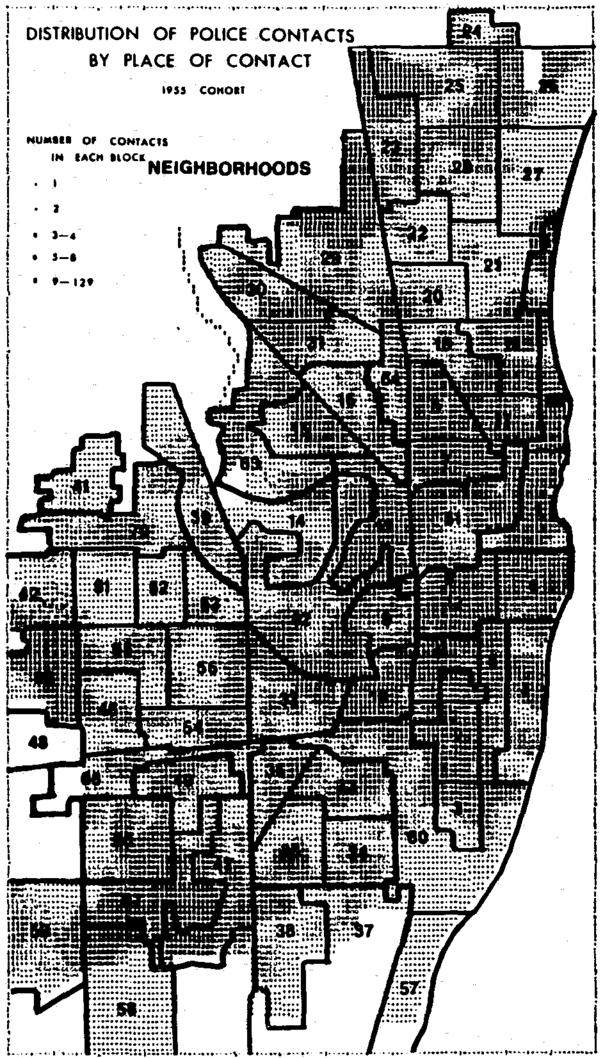
MAP 28


DISTRIBUTION OF POLICE CONTACTS
BY PLACE OF CONTACT
1942 COHORT

MAP 29


DISTRIBUTION OF POLICE CONTACTS
BY PLACE OF CONTACT
1949 COHORT

MAP 30


DISTRIBUTION OF POLICE CONTACTS
BY PLACE OF CONTACT
1955 COHORT

FOOTNOTES

[1] Richard Block has pointed out that urban dwellers have known that some neighborhoods are more dangerous than others since at least the Renaissance. Although folk wisdom may reflect real crime counts, he goes on to show that the explanation of high rates of violent crime in some communities is not simple. See Richard Block, "Community, Environment, and Violent Crime," Criminology, Vol. 17, May 1979, pp. 46-57.

[2] Although these maps were developed from block data, this is not a practical unit for spatial analysis unless like kinds of blocks are aggregated to produce sizeable numbers from each cohort, as we now do in the construction of neighborhoods. If blocks are aggregated according to their characteristics such as housing quality, target density, vacancy rate, or whatever, statistical analyses may be conducted which produce some very useful results but the questions that can be answered by this approach are not central to this research. For the analyses that we have been conducting and will continue to conduct the block is simply too small a unit for statistical analysis of phenomena, particularly if the spatial relationship of units to each other is to be retained.