

**THE DIFFUSION OF HOMICIDE ACROSS  
NEIGHBOURHOODS:  
A SOCIAL ECOLOGICAL CASE STUDY OF BUFFALO,  
NEW YORK, 1950 – 1999**

**Elizabeth Anne Griffiths**

**A thesis submitted in conformity with**

**the requirements for the degree**

**Doctor of Philosophy**

**Department of Sociology**

**University of Toronto**

**© Copyright by Elizabeth Anne Griffiths, 2007**



Library and  
Archives Canada

Bibliothèque et  
Archives Canada

Published Heritage  
Branch

Direction du  
Patrimoine de l'édition

395 Wellington Street  
Ottawa ON K1A 0N4  
Canada

395, rue Wellington  
Ottawa ON K1A 0N4  
Canada

*Your file* *Votre référence*  
*ISBN: 978-0-494-28100-0*  
*Our file* *Notre référence*  
*ISBN: 978-0-494-28100-0*

#### NOTICE:

The author has granted a non-exclusive license allowing Library and Archives Canada to reproduce, publish, archive, preserve, conserve, communicate to the public by telecommunication or on the Internet, loan, distribute and sell theses worldwide, for commercial or non-commercial purposes, in microform, paper, electronic and/or any other formats.

The author retains copyright ownership and moral rights in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

#### AVIS:

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque et Archives Canada de reproduire, publier, archiver, sauvegarder, conserver, transmettre au public par télécommunication ou par l'Internet, prêter, distribuer et vendre des thèses partout dans le monde, à des fins commerciales ou autres, sur support microforme, papier, électronique et/ou autres formats.

L'auteur conserve la propriété du droit d'auteur et des droits moraux qui protègent cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

---

In compliance with the Canadian Privacy Act some supporting forms may have been removed from this thesis.

Conformément à la loi canadienne sur la protection de la vie privée, quelques formulaires secondaires ont été enlevés de cette thèse.

While these forms may be included in the document page count, their removal does not represent any loss of content from the thesis.

Bien que ces formulaires aient inclus dans la pagination, il n'y aura aucun contenu manquant.

  
**Canada**

# **The Diffusion of Homicide across Neighbourhoods:**

## **A Social Ecological Case Study of Buffalo, New York, 1950-1999**

**Elizabeth Anne Griffiths**

**Doctor of Philosophy**

**Department of Sociology**

**University of Toronto**

**2007**

### **ABSTRACT**

Recent scholarly attention has been directed at examining how violence spreads across the urban landscape through a process of diffusion. Couched within an in-depth, historical, case-study approach, this dissertation shows that homicide exhibits a process of 'relocation diffusion' across neighbourhoods in Buffalo between 1950 and the end of the twentieth century. The findings illustrate that this gradual diffusion process is observable only when the scope of the research extends over three or more decades. Spatial analytic and traditional multivariate methodologies provide evidence that both supports and refutes a racial invariance hypothesis. This hypothesis stipulates that differences in neighbourhood crime rates are attributable to differences in social structural characteristics and, moreover, that these effects are not race-specific. In support of this hypothesis, this study shows that neighbourhood homicide rates in Buffalo are driven by poverty and related disadvantages, rather than racial composition; however, this is true only during the later decades of the twentieth century. By contrast, in

employing a novel methodology that combines Exploratory Spatial Data Analysis and multinomial logit regression, the results show that racial composition is important in increasing a neighbourhood's vulnerability to the diffusion of homicide from adjoining areas. In effect, African American neighbourhoods in Buffalo are in a precarious position as a function of their spatial proximity to a smaller cluster of highly violent neighbourhoods. Additional analyses are aimed at investigating the degree of historical contingency in the types of characteristics that cluster in neighbourhoods, and the effects of these characteristics on both within-neighbourhood homicide rates and the diffusion of homicide over time. These issues are examined through the lens of the distinctive urban context and social history of Buffalo – a mid-sized, north-eastern, industrial centre that has undergone dramatic social, economic, and demographic transitions during the post-industrial era. To investigate the central questions driving this research, tract-level census data are linked to data on homicide incidents in Buffalo between 1950 and 1999. This dissertation extends the extant literature by providing a nuanced quantitative account of the relationship between neighbourhoods and homicide, embedded within an historical case-study approach that integrates the social ecology of violence in Buffalo.

## ACKNOWLEDGEMENTS

Writing a dissertation is a journey of intellectual growth that is accompanied by emotional trials and tribulations – from periods of immense self-doubt to times of overwhelming elation. This journey is not, thankfully, one that is taken alone. I am grateful to all of those who traveled with me during my time at the University of Toronto. First, Professor Rosemary Gartner, my supervisor and friend, taught me how to navigate social science research carefully, thoughtfully, and with a grace that I can only hope to emulate as I begin my professional career. I am grateful as well to have had a committee who pressed me to think through my arguments critically. Professors Julian Tanner, Tony Doob, and Bill McCarthy challenged me and stimulated my growth as a scholar. I am indebted also to Professor Lucia Benaquisto from McGill University for agreeing to serve as my external examiner and for providing such careful and insightful feedback in her report. It was Professor Augustine Brannigan from the University of Calgary who encouraged me to pursue graduate school and provided me with the confidence to try. I have become a better scholar as a result of my association with colleagues through the National Consortium on Violence Research. I am also thankful to the Buffalo Homicide and Major Crimes Unit for graciously allowing me access to their data and hosting me on my many trips.

The support and encouragement of my many close friends from graduate school carried me through the best and worst of times. To Breda McCabe who laughed with me, complained with me, and provided some of the most enlightening constructive criticisms of my work, you have made me a better sociologist and you are a true friend. To Carolyn Yule who spent countless hours thinking through the framing of my research questions

and providing me with the confidence to finish my dissertation, you are like a sister to me. Thank you also to Mark Asbridge, Lisa Clarkson, Rebecca Fulton, Randy Hart, Katie Kaukinen, Leslie Kenney, Tracy Matsuo, Andrew McKinnon, and Emi Ooka who were always generous with their time, support, and friendship. I would not have made it without you.

My family, John, Penny, Bill, and Peyton Griffiths have always been there for me and always will, and for that I am blessed. To my husband, Rick Tjoris, you are my rock, you are my biggest supporter, and you are my best friend...thank you. And last, but certainly not least, I was carried through by my four-legged angels who were always happy to see me no matter how much progress I had made on the dissertation, my beloved Almo and my new little Tucker.

## TABLE OF CONTENTS

<b>Abstract</b>	ii
<b>Acknowledgements</b>	iv
<b>List of Figures</b>	xi
<b>List of Tables</b>	xiii
<b>Chapter I. Neighbourhoods and Homicide</b> .....	1
1.1 Defining Neighbourhoods.....	3
1.2 Predicting Neighbourhood Homicide.....	6
1.2.1 Demographic Characteristics	
Race.....	6
Foreign Born.....	8
Age Structure.....	9
1.2.2 Socioeconomic Characteristics	
Poverty.....	10
Educational Attainment.....	11
Labour Force Participation.....	12
1.2.3 Housing Characteristics	
Owner-Occupied Housing.....	14
Vacancy.....	15
Residential Stability.....	16
1.3 The Social Ecology of Homicide.....	17
1.4 The Diffusion of Homicide.....	20
1.5 Unresolved Issues.....	21
1.6 A Case Study Approach: Buffalo, New York.....	22
1.7 The Scope of this Study.....	25
<b>Chapter II. An Abbreviated History of Buffalo</b> .....	28
2.1 The Early Twentieth Century in Buffalo.....	29
2.2 Post WWII: The Period Covered by this Study.....	32
2.3 Socioeconomic Changes in Buffalo.....	33
2.4 Race Relations in Buffalo.....	36
2.5 Housing and Urban Renewal.....	41
2.6 Conclusions.....	47
<b>Chapter III. Citywide Trends and Neighbourhood   Deviations</b> .....	51
3.1 Defining Neighbourhoods: Aggregation to Produce Citywide Effects.....	53
3.2 Descriptive Statistics: City-Level Trends.....	54
3.2.1 Trends in Demographic Characteristics.....	54
3.2.2 Trends in Socioeconomic Characteristics.....	58
3.2.3 Trends in Housing Characteristics.....	62
3.3 Bivariate Associations among Demographic, Socioeconomic, and Housing Variables in Neighbourhoods.....	65

3.4	An Overview of Trends in Homicide Post WWII.....	70
3.4.1	Citywide Homicide Trends in Buffalo.....	71
3.4.2	Homicide in Buffalo Neighbourhoods.....	72
3.4.3	Bivariate Associations between Demographic, Socioeconomic, and Housing Characteristics with Homicide.....	75
3.5	Conclusion.....	77
<b>Chapter IV. Homicide in Buffalo Neighbourhoods.....</b>		<b>93</b>
4.1	Homicide in Neighbourhoods over Time	
4.1.1	Is there Stability in Homicide Counts and Rates?.....	93
4.1.2	Preliminary Evidence for the Diffusion of Homicide across Neighbourhoods.....	97
4.1.3	Demographic, Socioeconomic, and Housing Characteristics of Neighbourhoods by Homicide Count Categories.....	101
	Demographic Trends.....	102
	Socioeconomic Trends.....	104
	Housing Trends.....	107
4.1.4	Summary.....	109
4.2	Homicide in Neighbourhoods across Space.....	111
4.2.1	Spatial Patterns in the Geography of Homicide: Stability or Diffusion?.....	112
4.2.2	Spatial Patterns in the Geography of Demographic, Socioeconomic, and Housing Characteristics.....	118
	Demographic Patterns.....	119
	Socioeconomic Patterns.....	120
	Housing Patterns.....	122
4.2.3	Comparing the Spatial Patterning of Demographic, Socioeconomic, and Housing Characteristics with the Spatial Patterning of Homicide.....	124
4.2.4	Summary.....	125
4.3	Conclusion.....	127
<b>Chapter V. Stability &amp; Change in Neighbourhood Characteristics.....</b>		<b>154</b>
5.1	Literature Review	
5.1.1	Historical Invariance.....	156
5.1.2	Historical Contingency.....	159
5.2	Method.....	162
5.3	Results.....	165
5.3.1	Factor Analysis: 1950.....	165
5.3.2	Factor Analysis: 1960.....	167
5.3.3	Factor Analysis: 1970.....	167
5.3.4	Factor Analysis: 1980.....	168
5.3.5	Factor Analysis: 1990.....	168



5.4 Discussion.....	169
5.4.1 Stability in the Race and Housing Index.....	171
5.4.2 Concentrating Disadvantage in the Poverty Index.....	174
5.4.3 Distinctions in Forms of Disadvantage.....	177
5.4.4 The Exceptional 1990s.....	179
5.4.5 Summary.....	181
5.5 Conclusion.....	182
<b>Chapter VI. Explaining the Spatial Distribution of Homicide.....</b>	<b>188</b>
6.1 Literature Review.....	190
6.1.1 Predictors of Neighbourhood Homicide.....	191
6.1.2 The Importance of Space.....	194
6.1.3 The Importance of ‘Neighbours’: Homicide Clusters..	196
6.2 Method.....	198
6.2.1 Predicting Neighbourhood Homicide Rates.....	199
6.2.2 Predicting Neighbourhood Clusters.....	201
6.3 Results	
6.3.1 Predictors of Neighbourhood Homicide Rates.....	203
Ordinary Least Squares Model for the 1950s.....	204
Two-Stage, Least Squares Model for the 1960s.....	204
Two-Stage, Least Squares Model for the 1970s.....	205
Two-Stage, Least Squares Model for the 1980s.....	206
Two-Stage, Least Squares Model for the 1990s.....	206
6.3.2 Predictors of Neighbourhood Clusters.....	208
Multinomial Logit Model for the 1950s.....	208
Multinomial Logit Model for the 1960s.....	209
Multinomial Logit Model for the 1970s.....	211
Multinomial Logit Model for the 1980s.....	211
Multinomial Logit Model for the 1990s.....	212
6.4 Discussion.....	213
6.4.1 Predicting Neighbourhood Homicide Rates.....	213
6.4.2 Predicting Membership in High Rate Clusters.....	216
6.4.3 A Comparison between Neighbourhood Homicide Rates & Membership in High Rate Clusters.....	218
6.5 Conclusion.....	220
<b>Chapter VII. Summary and Conclusions.....</b>	<b>232</b>
7.1 Summary of Findings.....	234
7.2 Theoretical Overview and Implications	
7.2.1 The Social Ecology of Social Disorganization.....	238
7.2.2 Temporal Trends in the Social Ecology of Homicide..	240
7.2.3 Across-Neighbourhood Outcomes.....	241
7.2.4 Predicting the Pattern of Diffusion.....	242
7.3 Policy Implications.....	243
7.4 Main Contributions of the Study.....	248

7.5 Directions for Future Research.....	250
7.5.1 Augmenting the “Patterns of Homicide” Literature with Social Ecology.....	251
7.5.2 Disaggregating Homicide Rates.....	253
7.5.3 Generalizability: City Contexts, Historical Periods & Types of Crime.....	254
7.5.4 A Cautionary Note on Fallacies.....	255
7.6 Limitations and Recommendations.....	256

## Appendices

3.I Data Sources & Description.....	261
1) Elizabeth Mullen Bogue Files, 1950 and 1960.....	261
2) Neighbourhood Change Data Base, 1970 to 1990.....	262
3) Buffalo Homicide Data.....	262
3.II Map of Buffalo Highlighting Tract Boundary Changes...	266
3.III Output and Employment in the Manufacturing Sector...	267
3.IV Defining and Measuring Poverty.....	268
4.I Map of Buffalo with 26 Neighbourhoods Experiencing One or More Homicides in Each of the Five Decades, 1950s through 1990s.....	270
4.II Means and Standard Deviations for Tracts with Zero, One, and Two or More Homicide Incidents	
Table 4.5: Between 1950 and 1959.....	271
Table 4.6: Between 1960 and 1969.....	271
Table 4.7: Between 1970 and 1979.....	272
Table 4.8: Between 1980 and 1989.....	272
Table 4.9: Between 1990 and 1999.....	273
4.III Bivariate Correlations with Homicide Count and Count Categories	
Table 4.10: Percent Foreign Born.....	274
Table 4.11: Percent Young.....	274
4.IV Enlarged Figures from Chapter 4	
Figure 4.1.....	275
Figure 4.16.....	279
Figure 4.17.....	282
Figure 4.18.....	285
Figure 4.19.....	288
Figure 4.20.....	291
Figure 4.21.....	294
Figure 4.22.....	297
Figure 4.23.....	300
Figure 4.24.....	303
Figure 4.25.....	306
Figure 4.26.....	309
Figure 4.27.....	312
Figure 4.28.....	315

6.I Models Regressing the 1990s Neighbourhood Homicide Rate on the Spatial Lag of Homicide with Each of the Independent Variables in Isolation.....	318
6.II Multinomial Logit Regression Excluding Factor Indices, Buffalo 1960s.....	319
<b>References</b>	<b>320</b>

## LIST OF FIGURES

<b>2.1</b> Map of Buffalo Neighbourhoods.....	50
<b>3.1</b> Total Population, Buffalo.....	81
<b>3.2</b> Percent African American.....	81
<b>3.3</b> Percent Black and Hispanic.....	82
<b>3.4</b> Percent Young Population.....	82
<b>3.5</b> Percent Foreign Born.....	83
<b>3.6</b> Percent Completed High School.....	83
<b>3.7</b> Percent in Labour Force by Sex, United States and Buffalo.....	84
<b>3.8</b> Percent Below the Poverty Line.....	85
<b>3.9</b> Percent Owner-Occupied Housing.....	86
<b>3.10</b> Percent Owner-Occupied Housing by Race.....	86
<b>3.11</b> Percent Vacant Housing.....	87
<b>3.12</b> Percent Residentially Stable: Mean for City (M) and Range among Neighbourhoods (High/Low).....	87
<b>3.13</b> Total Homicide Victimization Rate per 100,000: Buffalo N.Y., 1950-1999.....	89
<b>3.14</b> Average Homicide Rate for each Decade, for Selected High-Rate Tracts in Buffalo.....	91
<b>4.1</b> Scatterplots Illustrating Bivariate Relationships of Neighbourhood Homicide Count by Decade, Buffalo, 1950s to 1990s.....	130
<b>4.2</b> Concentration and Dispersion in Homicide across Neighbourhoods in Buffalo, 1950s through 1990s.....	132
<b>4.3</b> Average Homicide Rate and Count in Buffalo Neighbourhoods, 1950s to 1990s.....	132
<b>4.4</b> Percent Black by Tract Homicide Categories.....	133
<b>4.5</b> Percent Young Population by Tract Homicide Categories.....	134
<b>4.6</b> Percent Foreign Born by Tract Homicide Categories.....	134

<b>4.7</b>	<b>Percent High School Attainment by Tract Homicide Categories.....</b>	<b>135</b>
<b>4.8</b>	<b>Percent of Males in Labour Force by Tract Homicide Categories.....</b>	<b>135</b>
<b>4.9</b>	<b>Percent of Females in Labour Force by Tract Homicide Categories.....</b>	<b>136</b>
<b>4.10</b>	<b>Percent in Poverty by Tract Homicide Categories.....</b>	<b>136</b>
<b>4.11</b>	<b>Percent Owner-Occupied Housing by Tract Homicide Categories.....</b>	<b>137</b>
<b>4.12</b>	<b>Percent Black Owner-Occupied Housing by Tract Homicide Categories.....</b>	<b>137</b>
<b>4.13</b>	<b>Percent Vacant by Tract Homicide Categories.....</b>	<b>138</b>
<b>4.14</b>	<b>Percent Residentially Stable by Tract Homicide Categories...</b>	<b>138</b>
<b>4.15</b>	<b>Point Pattern Maps of Homicide Incidents in Buffalo, 1950s through 1990s.....</b>	<b>139</b>
<b>4.16</b>	<b>Moran Scatterplot Maps of Buffalo Homicide Rates, 1950s through 1990s.....</b>	<b>140</b>
<b>4.17</b>	<b>Homicide Rate in Tract in Standard Deviation Units for Buffalo, 1950s through 1990s.....</b>	<b>142</b>
<b>4.18</b>	<b>Percent Black in Tract in Standard Deviation Units for Buffalo, 1950 through 1990.....</b>	<b>143</b>
<b>4.19</b>	<b>Percent Young Population in Tract in Standard Deviation Units for Buffalo, 1950 through 1990.....</b>	<b>144</b>
<b>4.20</b>	<b>Percent Foreign Born in Tract in Standard Deviation Units for Buffalo, 1950 through 1990.....</b>	<b>145</b>
<b>4.21</b>	<b>Percent High School Attainment in Tract in Standard Deviation Units for Buffalo, 1950 through 1990.....</b>	<b>146</b>
<b>4.22</b>	<b>Percent Males in the Labour Force in Tract in Standard Deviation Units for Buffalo, 1950 through 1990.....</b>	<b>147</b>
<b>4.23</b>	<b>Percent Females in the Labour Force in Tract in Standard Deviation Units for Buffalo, 1950 through 1990.....</b>	<b>148</b>
<b>4.24</b>	<b>Percent in Poverty in Tract in Standard Deviation Units for Buffalo, 1950 through 1990.....</b>	<b>149</b>
<b>4.25</b>	<b>Percent Owner-Occupied Housing in Tract in Standard Deviation Units for Buffalo, 1950 through 1990.....</b>	<b>150</b>
<b>4.26</b>	<b>Percent Black Owner-Occupied Housing in Tract in Standard Deviation Units for Buffalo, 1950 through 1990.....</b>	<b>151</b>
<b>4.27</b>	<b>Percent Vacant Housing in Tract in Standard Deviation Units for Buffalo, 1950 through 1990.....</b>	<b>152</b>
<b>4.28</b>	<b>Percent Residentially Stable in Tract in Standard Deviation Units for Buffalo, 1950 through 1990.....</b>	<b>153</b>

## LIST OF TABLES

<b>3.1</b>	Descriptive Statistics for the City of Buffalo by Decade: Mean averaged across all tracts.....	80
<b>3.2</b>	Descriptive Statistics for Percent Living Below the Poverty Line in Buffalo, 1950s through 1990s: Mean averaged across all tracts.....	85
<b>3.3</b>	Bivariate Correlations among Demographic, Socioeconomic, and Housing Characteristics in Buffalo, 1950 through 1990....	88
<b>3.4</b>	Descriptive Statistics for Homicide in Buffalo Neighbourhoods by Decade: Mean averaged across all tracts...	90
<b>3.5</b>	Bivariate Correlations between Demographic, Socioeconomic, and Housing Characteristics with Homicide Count (3.5a) and Homicide Rate (3.5b) in Buffalo Neighbourhoods by Decade..	92
<b>4.1</b>	Zero-Order Correlation Coefficients between the Counts of Homicides in Neighbourhoods across Census Decades, Buffalo, 1950s to 1990s.....	129
<b>4.2</b>	Zero-Order Correlation Coefficients between the Rate of Homicide in Neighbourhoods across Census Decades, Buffalo, 1950s to 1990s.....	129
<b>4.3</b>	Frequencies of Tracts with Zero, One, and Two or More Homicide Incidents by Decade, Buffalo.....	131
<b>4.4</b>	Zero-Order Correlation Coefficients for Tract Homicide Counts by Downtown Location.....	141
<b>5.1</b>	Factor Analyses Diagnostics, KMOs and Extracted Communalities by Decade, Buffalo, 1950 to 1990.....	184
<b>5.2</b>	Factor Loadings of Independent Variables for 1950, 1960, 1970, 1980, and 1990 in Buffalo.....	185
<b>5.3</b>	Majority Black Neighbourhoods (50%+) by Poverty Status, Buffalo.....	187
<b>6.1</b>	Frequency Distribution of Neighbourhood Homicide Clusters, 1950s through 1990s, Buffalo.....	224
<b>6.2</b>	Regression of Homicide Rates, Buffalo 1950 through 1990....	225
<b>6.3</b>	Multinomial Logit Regression Predicting Neighbourhood Membership in High and Low Homicide Rate Clusters, Buffalo 1950s.....	226
<b>6.4</b>	Multinomial Logit Regression Predicting Neighbourhood Membership in High and Low Homicide Rate Clusters, Buffalo 1960s.....	227
<b>6.5</b>	Multinomial Logit Regression Predicting Neighbourhood Membership in High and Low Homicide Rate Clusters, Buffalo 1970s.....	228
<b>6.6</b>	Multinomial Logit Regression Predicting Neighbourhood Membership in High and Low Homicide Rate Clusters, Buffalo 1980s.....	229

<b>6.7</b> Multinomial Logit Regression Predicting Neighbourhood Membership in High and Low Homicide Rate Clusters, Buffalo 1990s.....	230
<b>6.8</b> Multinomial Regression of “High High” Neighbourhood Clusters, Buffalo, 1950 through 1990.....	231

## **CHAPTER I. NEIGHBOURHOODS AND HOMICIDE**

Neighbourhoods have historically been an important source of socialization, guardianship, communal social capital, friendship ties, and identification markers for urban residents. Beginning with the Chicago School in the 1920s and extending to the present day, researchers have examined how neighbourhood context affects both individual-level outcomes for their residents, as well as more macro-level outcomes such as the concentration of crime and violence in cities (Mayer and Jencks 1989; Sampson and Groves 1989; Sampson and Wooldredge 1987; Shaw and McKay 1942; Suttles 1972). A recent resurgence in the 'neighbourhood effects' literature has prompted investigations into how and why violence concentrates where it does (Sampson, Morenoff and Gannon-Rowley 2002). This research shows that the spatial distribution of crime and violence in urban areas is linked to the structural characteristics of neighbourhoods, including concentrated poverty, residential instability, and racial segregation, among others (Baller, Anselin and Messner 2001; Heitgerd and Bursik 1987; Lee 2000; Morenoff and Sampson 1997; Parker and Pruitt 2000; Peterson and Krivo 1993; Stretesky, Schuck and Hogan 2004). Beyond the internal characteristics of neighbourhoods, a renewed attention to their spatial location within cities stresses the importance of the larger urban geography for producing neighbourhood-level outcomes, including homicide.

In my dissertation, I follow in this tradition by examining the spatial distribution of homicide across neighbourhoods in Buffalo, New York. The focus of this study is on exploring both how and why homicide diffused across the city. In particular, I investigate how neighbourhood demographic, socioeconomic, and housing characteristics



were related to both homicide rates within neighbourhoods and to the diffusion of homicide across neighbourhood boundaries. My research expands on recent studies of the spatial distribution of homicide in two important ways. First, I consider these relationships over a much longer time frame than has been the focus of past research; my research extends across five decades in a city undergoing substantial change. Second, I incorporate a more nuanced measure of the social ecology of the city as the key to understanding the changing spatial distribution of homicide across Buffalo's neighbourhoods. Specifically, I use a case study approach to examine the diffusion of homicide in the neighbourhoods of Buffalo during the immediate post WWII period through the end of the twentieth century.

This chapter proceeds as follows. First, I outline how neighbourhood boundaries have been operationalized in past research, and how I operationalize them in this study. Second, I describe the current state of the literature on predictors of neighbourhood homicide, the social ecology of homicide, and processes of diffusion across space. This is followed by a brief summary of how the present study helps to resolve some of the theoretical contradictions plaguing social ecological research that ignores a temporal dimension. Third, I stress the utility of using a case study approach for examining how and why homicide diffuses across the urban landscape. Attention to the unique social history of Buffalo shows that, while it shares much in common with other north-eastern industrial centres in the United States, it also departs from them in important ways. I argue that researchers in the social ecology tradition have failed to incorporate the larger social context and particular history of the urban areas that they study. Such a detailed approach provides a much more nuanced account of how and why neighbourhoods

become vulnerable to homicide. Finally, I end with a brief overview of the chapters to follow.

## **1.1 DEFINING NEIGHBOURHOODS**

Defining neighbourhoods, and creating a workable empirical unit to use in practice, has proven difficult. Bursik and Grasmick (1993: 6) argue that a neighbourhood is identified by three characteristics; a small geographic space within a larger residential area, social networks and institutions that produce a 'collective life' among residents, and local residents who identify with the area over time. To date, researchers have engaged in extensive debates over how to best define the geographic borders of individual neighbourhoods for the purposes of analyses.

For example, Grannis (1998, 2002) argues that neighbourhoods should be operationalized by the cognitive maps of pedestrian street networks that individuals use in their day-to-day activities, and which thus serve to identify the boundaries of their community. He suggests that strong friendship ties and consistent travel patterns of residents show that neighbourhoods are best defined by those street networks nearest to the residence that do not cross a major thoroughfare. Most residents, Grannis argues, restrict their mobility and social network ties to those places within walking distance and along side streets of the immediate geographic space.

Yet even Grannis' (1998, 2002) social-geographic approach to defining neighbourhood boundaries may not be qualitatively meaningful for residents. For example, Furstenberg and Hughes (1997) argue that neighbourhoods are often defined

differently from the focal point of individuals in the same socio-spatial area, and even within the same household. They claim that

...(g)eographical neighborhoods are not highly relevant entities for many [people], as their ties extend beyond their neighborhood. Important social institutions are often located beyond the confines of the neighborhood – however defined – implying that many residents are weakly attached to the areas where they reside. Like ‘family’, ‘neighborhood’ is a highly malleable concept full of personal meaning but often idiosyncratically and not invariably consequential for behaviour (Furstenberg and Hughes, 1997: 34).

Therefore, questions about the relevance of neighbourhood-level research are raised by scholars who argue that the geographic spaces in which we live are becoming less salient as sources of identities and intimate social networks. Indeed, Putnam (2000) contends that the internet and faster, cheaper transportation routes have resulted in less localized networks comprising an individual’s “community.” These arguments hold sway in so far as people are using communication venues to gain support networks and using transportation routes to carry out daily activities. In Buffalo, however, although the percentage of people using personal computers rose between 1994 (25 percent) and 1998 (37 percent), the use of computers lagged behind other areas in Western New York including Rochester, New York City, Syracuse, and Albany (Institute for Local Governance and Regional Growth 2000). This report suggests that

...(f)or the Buffalo area, the lower rate of computer use is coupled with relatively lower household income. With a median household income of \$33,000 – 3% below the statewide median – the Western New York rate of computer use is nearly 10% below the national benchmark regions’ median (ibid, section 5.2).

In addition, the Buffalo-Niagara Falls Metropolitan Area had lower car commuting levels and shorter commuting times compared to other metropolitan areas including St. Louis, Cleveland, and Detroit, and public transit ridership figures declined

in the early 1990s (ibid, section 10.5). Taken together, these findings imply that social neighbourhoods in Buffalo may overlap with geographic neighbourhoods more completely than would be the case in other cities, particularly for those people and neighbourhoods at greatest risk of homicide.

Despite the difficulties in defining and operationalizing the concept of neighbourhoods, researchers studying this level-of-analysis have generally employed political administrative units defined by the United States Census Bureau as proxy measures for neighbourhood boundaries. The most common definition used in empirical research is the census tract (Sampson, Morenoff, and Gannon-Rowley 2002). I use tracts to delineate neighbourhoods because socio-demographic information is routinely collected by the Census Bureau on these consistent geographies over time.<sup>1</sup> Tract boundaries were originally drawn to capture small geographic areas that were relatively homogenous on certain population characteristics, economic status, and living conditions, and each ideally comprised about 4,000 people for purposes of enumeration (U.S. Bureau of the Census 2000). I contend that the immediate conditions of the area in which people reside and the types of amenities available there inevitably have an impact on residents. Indeed, researchers have shown that neighbourhood context matters for a host of

---

<sup>1</sup> There are a number of issues with respect to neighbourhood boundaries that are very hard to resolve in historical research. Of particular importance in this study are the neighbourhood characteristics that lead to changes in the spatial distribution of homicide across the city; however changes in the physical landscape of neighbourhoods may cause internal boundaries to shift. An example of this would be the construction of the Humboldt Parkway through an integrated middle-class neighbourhood in Buffalo in 1958. Arguably, this neighbourhood was partitioned into two or more different neighbourhoods after construction of the highway. However, the available data on neighbourhoods collected by the Census Bureau restricts researchers to using consistent geographic spaces over time as measures of neighbourhood boundaries. There are both advantages and disadvantages to doing so. I acknowledge that tracts are an imperfect measure of neighbourhood boundaries, particularly over an extended period of time, however they serve as a most suitable alternative in historical neighbourhood-level research.

individual-level and macro-level health-related outcomes (Brooks-Gunn, Duncan, and Aber 1997a).

## **1.2 PREDICTING NEIGHBOURHOOD HOMICIDE**

Following mid-nineteenth century thinkers Guerry (1833) and Quetelet (1831), researchers in the social ecology tradition focused heavily on “societal conditions,” generally the social and economic features of geographic spaces, as causes of crime in urban areas (Fletcher 1849; Mayhew 1861). This voluminous literature has produced a large body of scientific knowledge about the kinds of neighbourhoods that are vulnerable to crime and violence (Bursik and Grasmick 1993; Kubrin and Herting 2003; Peterson, Krivo and Harris 2000; Sampson et al. 2002; Shaw and McKay 1942). In particular, three categories of structural characteristics have been identified as important predictors of neighbourhood homicide rates; these are demographic, socioeconomic, and housing characteristics. While disentangling the characteristics of urban neighbourhoods for the purposes of isolating criminogenic structural factors is exceptionally difficult (Byrne and Sampson 1986a), I review relevant research on the association between each of these features and rates of neighbourhood crime and violence in turn.

### **1.2.1 Demographic Characteristics**

#### **RACE**

Perhaps one of the most contentious, and consistent findings in the literature on neighbourhood effects and crime is the relationship between ethnic or racial composition of neighbourhoods and crime rates. In some of the earliest studies of urban America, researchers at the Chicago School argued that ethnic heterogeneity was one of three

neighbourhood characteristics – in addition to socioeconomic disadvantage and residential instability – associated with high levels of juvenile delinquency in affected neighbourhoods (Shaw and McKay 1942). The theoretical argument for explaining how racial and ethnic diversity was causally related to crime centred on the premise that heterogeneity restricted social interaction between residents as a function of cultural difference, and thus limited collective efforts at order maintenance and social control. The resulting state of social disorganization bred delinquency and crime.

The direction of the relationship between neighbourhood racial composition and crime transformed over time such that homogeneous minority neighbourhoods, particularly African American neighbourhoods, came to exhibit higher rates of crime and violence in cities (Peterson and Krivo 2005; Sampson 1987; Wilson 1987). Wilson (1987) was among the first to argue that a dearth in research on African American neighbourhood crime rates could be attributed to hesitancy on the part of researchers to explore the causes of this disparity out of a misplaced concern with political correctness. Historical discrimination in the labour market, social isolation from other neighbourhoods, severe economic disadvantage, and inner city disinvestment combined to produce higher crime and violence rates in the neighbourhoods inhabited by lower class African Americans. Heightened crime further isolated African American residents in poorer neighbourhoods over time, as it prompted what some have called “white flight” from central cities (Cullen and Levitt 1999; Liska and Bellair 1995; South and Deane 1993). Thus, black neighbourhoods in contemporary urban areas are particularly vulnerable to high rates of crime and violence, including homicide.

## FOREIGN BORN

The importance of neighbourhood ethnic heterogeneity to social disorganization researchers mattered not simply in terms of race, but also in terms of immigration and the resulting cultural clash regarding norms and mores. Yet in some of the earliest commissioned studies on the relationship between immigration and crime, including reports by the Federal Immigration Commission (1910), the National Commission on Law Observance and Enforcement (1936), the Glueck's longitudinal research on Boston parolees (1930), and studies by Edwin Sutherland (1934), a negative relationship between immigration and crime has been consistently identified at the individual-level (see also Van Vechten 1941). According to the National Commission on Law Observance and Enforcement (1936: 4),

...in proportion to their respective numbers the foreign-born commit considerably fewer crimes than the native born;...the foreign-born approach the native-born most closely in commission of crimes involving personal violence;...[and] in crimes for gain the native-born greatly exceed the foreign-born.

Despite these consistent findings, however, public concerns over crime have tended to coincide with large-scale waves of immigration during the twentieth century (Hagan and Palloni 1998). Attention to the relationship between immigration and crime in the United States has resurfaced in recent years with the influx of immigrants from Latin America, particularly Mexico, and Asia. Again, however, the bulk of the empirical evidence shows that the foreign born population is not only proportionately less likely to be involved in criminal offending, but also that neighbourhoods, metropolitan areas, and even states bordering Mexico have lower than average violent crime rates despite larger immigrant populations, once other relevant characteristics are controlled (Hagan and

Palloni 1998; Lee et al. 2000, 2001; Martinez 2002; Reid et al. 2005). The relationship between the size of the foreign born population and neighbourhood crime rates, it is argued, is dependent on the age structure of the immigrant population, the education levels of immigrants, labour force opportunities afforded to immigrants, and the degree to which immigrant populations settle in urban ethnic enclaves (Reid et al. 2005). Nonetheless, even in immigrant neighbourhoods that are extremely economically disadvantaged, researchers have found that homicide rates are lower than are those in similarly disadvantaged neighbourhoods inhabited by predominantly native born residents (Lee et al. 2000, 2001; Martinez 2002).

#### **AGE STRUCTURE**

According to the age-crime curve (Hirschi and Gottfredson 1983), violent offending is the domain of youth. As such, neighbourhoods with larger proportions of young people are likely to exhibit higher rates of violent crime to the extent that offenders are involved in incidents close to home (Tita and Griffiths 2005). Studies consistently show that age structure is an important predictor<sup>2</sup> of neighbourhood crime (Ingoldsby and Shaw 2002; Taylor and Covington 1988; Wooldredge and Thistlewaite 2003), despite variation in the age range used by different authors. For example, Wooldredge and Thistlewaite (2003) include a measure of the proportion of the population aged 12 through 20 in predicting neighbourhood rates of intimate assault, Taylor and Covington (1988) show that percent aged 0 to 5 and percent aged 6 to 13 load with percent black in producing a minority/youth factor predictive of neighbourhood crime and violence, and Sampson (1987) employs median age of the black population as

---

<sup>2</sup> Age structure is routinely identified as a control variable in neighbourhood-level research. As such, the link between age structure and neighbourhood crime and violence rates is expected to exist, yet it is not the focus of most neighbourhood research.



a control variable in his study on urban violence among black males.<sup>3</sup> Researchers have also linked the age composition of neighbourhoods to poverty such that neighbourhoods with large proportions of children relative to adults tend to have higher poverty rates (Brooks-Gunn et al. 1997a; Coulton and Pandey 1992), which is itself associated with crime and violence.

### **1.2.2 Socioeconomic Characteristics**

#### **POVERTY**

Economic disadvantage is arguably the most consistent predictor of aggregate rates of crime and violence in the extant research on neighbourhoods, cities, and states (Blau and Blau 1982; Boggs 1965; Byrne and Sampson 1986a; Chilton 1964; Land, McCall and Cohen 1990; Ousey 1999; Sampson and Groves 1989). Moreover, evidence suggests that, since the 1970s, a growing number of neighbourhoods in U.S. cities exhibit high rates of poverty (Jargowsky 1997; Jargowsky and Bane 1991). This extension of poverty across a larger number of neighbourhoods has been accompanied by a growth in the level, or concentration of poverty within economically disadvantaged neighbourhoods (Krivo and Peterson 1996; Wilson 1987).

Neighbourhoods distinguished by poverty are, according to Wilson (1987), uniquely exposed to an array of criminogenic influences both as a function of their absolute deprivation, and as a function of their relative deprivation (Blau and Blau 1982). The post-industrial transition to a service-based economy and the trend toward increased suburbanization during the 1970s and 1980s resulted in a host of problems for residents of poverty-stricken, inner city neighbourhoods. Chief among them were increases in

---

<sup>3</sup> In different studies, at various aggregate levels-of-analysis, alternative measures of age composition have been used including age ranges between 15 and 34, between 20 and 34, and between 15 and 24, as well as assorted gender- and race-specific combinations (Land, McCall and Cohen 1990).

social isolation from mainstream society and mounting concentrated disadvantage (Sampson and Wilson 1995; Wilson 1987; Wacquant and Wilson 1989).

However, the mechanisms through which poverty influences crime rates are the subject of some debate in the literature. Sampson and Groves (1989) demonstrate that the effect of socioeconomic disadvantage on crime is largely indirect, wherein poverty causes social disorganization in neighbourhoods and social disorganization, in turn, causes the crime rate to rise. Yet, the structural arguments made by social disorganization researchers (Bursik and Grasmick 1993; Kornhauser 1978; Sampson and Groves 1989) have been questioned by recent ethnographic evidence (Anderson 1999; Bourgois 2003). According to ethnographers of the inner city, the link between poverty and crime may be more aptly explained by the development of a street subculture in response to poverty that is tolerant of crime. Whatever the mediating factors are, however, neighbourhoods experiencing socioeconomic disadvantage are neighbourhoods with high violence rates. Moreover, the higher the concentration of poverty in the neighbourhood, the more pronounced the homicide rate (Hannon 2005; Krivo and Peterson 1996; Lee 2000).

#### **EDUCATIONAL ATTAINMENT**

In neighbourhood-level research, educational attainment is theorized to produce negative effects on violent crime in a manner consistent with median income or socioeconomic status. That is, neighbourhoods with higher proportions of the population who are educated tend to be places with higher overall socioeconomic status and lower crime rates (Sampson and Lauritsen 1994).

While few studies explicitly separate the influence of educational attainment from other variables on neighbourhood homicide rates, what research has been carried out suggests that higher educational attainment produces benefits that extend beyond a reduction in crime to include more active social institutions and stronger neighbour networks. For instance, in examining the distribution of education across neighbourhoods in New York City, Galea and Ahern (2005: 2203) show that the “...overall mean level of education is associated with better short-term health indicators [including homicide rate] in a given neighbourhood.” They further demonstrate that the effect of having even a few residents with high educational attainment produces positive neighbourhood outcomes, once mean educational attainment levels are controlled. To the extent then that education promotes self-efficacy, greater overall levels of education appear to contribute to the collective efficacy of neighbourhoods.

Similarly, in a comparison of the residential neighbourhoods of homicide victims to neighbourhoods devoid of victims, Dobrin et al. (2005) find that educational attainment, in the form of percent of the population graduating from high school, decreases the odds of becoming a homicide victim even after relevant neighbourhood-level and individual-level controls are added to the models. The average educational attainment of neighbourhood residents is expected, then, to influence neighbourhood homicide rates.

#### **LABOUR FORCE PARTICIPATION**

The relationship between labour force participation and crime has garnered substantial attention from academics. Efforts are generally focused on dispelling myths and stereotypes about the subculture of poverty by revealing the mainstream values and

intentions of the poor. This endeavour is primarily a response to conservative assumptions that inner city residents demonstrate a general ‘shiftlessness,’ or desire not to work (Tienda and Stier 1991).<sup>4</sup> While contradictory findings on the relationship between labour force participation<sup>5</sup> and crime exist at the individual level (Gottfredson and Hirschi 1990; Sampson and Laub 1990; Uggen 2000), studies of neighbourhoods, cities, and states report a consistent negative relationship between rates of labour force participation and violent crime rates (Crutchfield 1989; Sampson 1987).

For instance, Almgren et al. (1998) show that, consistent with Wilson’s (1987) thesis on the social transformation of inner city neighbourhoods as a function of general economic decline, homicide rates in Chicago’s community areas are predicted by

---

<sup>4</sup> According to Tienda and Stier (1991), “shiftless” residents are those who maintain a desire not to become legally employed, instead preferring other forms of support, both legal (i.e. welfare, social assistance) and illegal. These and other researchers find however that among the majority of inner city residents there is a *willingness but inability* to work, in large part because employment opportunities are not readily available (see also Newman 1999). Nonetheless, prolonged unemployment and limited future prospects can result in a withdrawal from the labour force creating a class of ‘discouraged’ workers who are not actively seeking employment (Adams 1981; Norwood and Tanur 1994).

<sup>5</sup> Much of the literature relies on unemployment data rather than labour force participation data. The census measure of unemployment determines the number of “...persons who did not work or have a job during the reference week and who were actively looking for work during the last 4 weeks and were available for work during the reference week” (CPS Basic Monthly Survey 2005). By contrast, labour force participation includes persons either working or looking for a job.

Decisions regarding use of labour force participation versus unemployment measures thus rest on whether the researcher seeks to distinguish between those who are “discouraged workers” (those who believe that there are no jobs available or none for which they would qualify) and those who either work or retain some hope of working legally but who may not have found an opportunity to do so during the previous month. Neither measure is completely satisfactory for the purposes of examining neighbourhoods and crime. For instance, unemployment measures completely omit “discouraged” individuals who have stopped looking for legal work avenues altogether. This is problematic to the extent that the literature shows that those in extremely disadvantaged neighbourhoods, and in neighbourhoods with active drug markets and high crime rates, are the most likely to become “discouraged” (Bourgois 2003). Moreover, Wilson’s concept of the ‘underclass’ in his writings on the social transformation of Chicago’s urban ghettos is based on the premise that residents have a “weak attachment to the labor force” (cited in Taylor 1991: 571 fn. 9).

There are, however, problems with labour force participation measures as well. First, they do not distinguish among those who are working and those who are looking for work. Second, they include not simply discouraged workers as non-participants in the labour force, but also homemakers, retirees, and disabled persons. Thus, neither measure is ideal for linking involvement in work with homicide at the neighbourhood-level. In this study, I opted to use a measure of labour force participation instead of unemployment so as to capture “discouraged” workers in my analyses.

joblessness, with the effect strengthening between 1970 and 1990. Similarly, Crutchfield (1989) demonstrates that a measure of labour instability, which combines the unemployment rate and secondary labour market participation in Seattle census tracts, is strongly related to neighbourhood homicide rates.

While rates of violent crime are negatively associated with the overall rate of labour force participation, researchers have shown that increases in female labour force participation starting in the 1970s has had the opposite effect on women's violent victimization experiences (Macmillan and Gartner 1999). Therefore, in this study I separately examine the influence of both male and female labour force participation on neighbourhood homicide rates, over a period when male labour force participation declined and female labour force participation grew in the United States.

### **1.2.3 Housing Characteristics**

#### **OWNER-OCCUPIED HOUSING**

Studies show that neighbourhoods with more owner-occupied housing are neighbourhoods that enjoy lower crime rates (Glaeser and Sacerdote 1999; Hoff and Sen 2005; Krivo and Peterson 2000; Sampson et al. 1997; White 2001). Home ownership is expected to function to reduce violence in neighbourhoods through a number of plausible mechanisms. Some argue that home ownership represents a measure of residential stability such that homeowners generally have longer tenure in neighbourhoods than do renters (Krivo and Peterson 2000; White 2001). Others argue that the financial investment made by residents who own homes increases civic participation and strengthens instrumental forms of interaction among neighbours (Ahlbrandt 1984; Rohe and Basolo 1997; White 2001). In turn, involvement in community organizations fosters

social control and reduces crime (Sampson and Groves 1989). A related effect of increased interaction among residents is the likelihood that homeowners will invest more in social relationships with others in the neighbourhood, beyond instrumental communications. Such interactions would stimulate the friendship networks and social bonds that inhibit crime, increase guardianship, and promote general social cohesion.

The extant research indicates that neighbourhoods high in owner-occupied housing exhibit lower rates of burglary, motor vehicle theft, other theft, and violence (Roncek 1981; Ross 1977). However, the relationship between home ownership and violence is complex. There may be reciprocal influences of owner-occupied housing and crime such that higher crime rates lead to reduced home ownership as a function of increased mobility out of the neighbourhood (Dugan 1999; Morenoff and Sampson 1997; White 2001). Yet White (2001) shows that this phenomenon occurs primarily in upper income neighbourhoods, with homeowners in lower income and declining neighbourhoods becoming increasingly trapped by their investments (see also South and Crowder 1998). Despite the complexity of the relationship between owner-occupied housing and crime, the bulk of the literature shows a negative relationship between the two.

#### **VACANCY**

The presence of vacant housing has been conceptualized by researchers as a measure of the degree of disorder and disorganization within neighbourhoods (Bursik and Grasmick 1993; Skogan 1990). That is, high vacancy represents both transience in the residential population and a measure of limited desirability of the neighbourhood as a place to live. High vacancy rates thus characterize disorganized neighbourhoods that

exhibit higher rates of crime. For instance, Shihadeh and Shrum (2004) show that high residential vacancy rates of neighbourhoods, represented by block groups, in Baton Rouge significantly predicted homicide, attempted homicide, and burglary rates. Indeed, vacancy exerted the strongest effect in their model for homicides, even controlling for economic deprivation, age structure, and racial composition.

### **RESIDENTIAL STABILITY**

Neighbourhoods that experience greater residential stability tend to be neighbourhoods that exhibit lower rates of crime and violence (Bursik and Grasmick 1993; Shaw and McKay 1942). When population turnover is high, residents are unable to form friendship networks, a basis for informal organization. The social cohesion that is created from integration of residents promotes a shared sense of responsibility over the neighbourhood and its inhabitants (Durkheim 1933; Wilkinson 1984). Sampson et al. (1997: 919) clarify the destabilizing effect of residential mobility on neighbourhoods:

A high rate of residential mobility, especially in areas of decreasing population, fosters institutional disruption and weakened social controls over collective life. A major reason is that the formation of social ties takes time.

The current neighbourhoods and crime literature suggests that, particularly in cities undergoing rapid depopulation, the positive relationship between residential mobility and homicide rates may be a reciprocal one such that residential mobility is both a cause and a consequence of high rates of neighbourhood homicide (Morenoff and Sampson 1997). Nonetheless, neighbourhoods high in population turnover have been identified in the literature as places that exhibit elevated rates of crime and violence, including homicide.

### 1.3 THE SOCIAL ECOLOGY OF HOMICIDE

Given that the distribution of demographic, socioeconomic, and housing characteristics across neighbourhoods in cities is not random, it is perhaps not surprising that crime and violence are also non-randomly distributed across space. The extant research on the spatial distribution of homicide finds that it is concentrated within a small number of neighbourhoods where rates soar above the national average (Griffiths and Chavez 2004; Kubrin and Weitzer 2003a; Menard and Huizinga 2001; Morenoff and Sampson 1997; Rosenfeld 2000; Schuerman and Kobrin 1986; Shaw and McKay 1942; Sherman 1997; Skogan 1990; Wilson 1987). For example, Rosenfeld (2000: 146) found that the homicide rate in the top decile of census tracts in Chicago was "...nearly 20 times higher than those recorded for the nation as a whole during the 1980s and early 1990s." And in 1983, 11 percent of Chicago's homicides occurred in a "...four-square-mile district, which contains only 3.4 percent of the city's total population" (Wilson, 1987: 25). Similar concentrations of homicide in a small number of neighbourhoods have been noted in other cities (Hannon 2005; Kubrin and Weitzer 2003a; Schuerman and Kobrin 1986). To explain this variation, two competing traditions in explaining the role of neighbourhood effects on crime rates have emerged: ecological and non-ecological perspectives (Byrne 1986).

Those researchers who argue from a non-ecological, or compositional, perspective suggest that the established variation in crime rates among neighbourhoods is a function of the characteristics of residents inhabiting those neighbourhoods. Thus, the "...personal characteristics of population aggregates" explains disparities in the level of crime experienced by urban neighbourhoods (Byrne 1986: 79). Ecological perspectives,



by contrast, are based on the assumption that the physical characteristics of places, such as size and density, as well as land-use influence crime rates (Brantingham and Brantingham 1981; Byrne and Sampson 1986b; Messner and Tardiff 1985; Wirth 1964). Social ecologists integrate the two perspectives in arguing that measures of population composition, in addition to the contextual characteristics of neighbourhoods, are required to adequately explain variation in crime rates across cities.

Regardless of the approach taken, a number of consistent findings have emerged in the literature. First, neighbourhoods differ substantially in their rates of homicide. Second, the demographic, socioeconomic, and housing characteristics of neighbourhoods discussed above are associated with homicide rates. And finally, neighbourhoods with high homicide rates tend to be situated in close proximity to one another across the urban landscape.

Absent from this literature is a focus on larger time frames for examining the spatial distribution of homicide in cities, and patterns of change in that distribution. The majority of studies in this tradition have relied on cross-sectional analyses or spanned relatively short time periods (Byrne and Sampson 1986a). Even Shaw and McKay's (1942) classic work identifying stability in Chicago's delinquency areas examined data from three six-year periods (1900-1906, 1917-1923, and 1927-1933), albeit covering some part of three decades.

Little is known, then, about the extent to which there is ecological stability in the places that are the most violent over longer time periods. Some suggest that there is relative stability in the neighbourhoods that experience violence over ten or twenty years primarily because the characteristics of those places (i.e., high residential mobility, ethnic

heterogeneity, and socioeconomic disadvantage) are fairly enduring, despite turnover in the residential population (Shaw and McKay 1942). Others argue that neighbourhoods undergo transitions in levels of crime and violence, but generally in the direction of movement toward increasingly higher crime rates. For instance, Schuerman and Kobrin (1986) found that the highest ten percent of neighbourhoods in terms of crime rates in the 1970s could be clustered into three distinct groups in the decade following 1970 depending on their stage of development – these groups included the ‘emerging,’ the ‘transitional,’ and the ‘enduring’ neighbourhoods. Each of these stages corresponded with an increase in neighbourhood crime levels over time (Schuerman and Kobrin 1986; see also Skogan 1990).

Moreover, the literature on urban crime patterns is a product of the post-1960s period, when the loss of industrial manufacturing and the rapid expansion of suburbia had already begun.<sup>6</sup> The period between the 1970s and the 1990s, in many cities, also postdates public housing construction; and the focus of research is principally on large industrial cities, particularly Chicago, which may not characterize the experience of smaller industrial centres such as Buffalo (Taylor 1991). In addition, determining where the most violent neighbourhoods in the city are located at one point in time provides little information about whether there have been changes in the spatial distribution of homicide over time and more importantly, what the causes of such changes might be. One particularly important cause of a shifting spatial distribution of homicide across neighbourhoods is diffusion.

---

<sup>6</sup> For notable exceptions see Bursik (1986a) and Miethe et al. (1991).

#### 1.4 THE DIFFUSION OF HOMICIDE

Ecological perspectives assume that the neighbourhood context, above and beyond aggregating the characteristics of individuals inhabiting the area, matters for producing a non-random distribution of violence across cities. This emphasis has been extended in recent studies to include extra-local characteristics; in particular, the geographic patterning of neighbourhoods in cities. That is, researchers increasingly argue that intra-neighbourhood outcomes, such as homicide rates, may be influenced not only by intra-neighbourhood compositional and contextual characteristics, but also by the characteristics of bordering neighbourhoods (Anselin et al. 2000; Baller et al. 2001). In doing so, they have incorporated spatial econometric models equipped to assess the effects of homicide rates in surrounding neighbourhoods on internal neighbourhood homicide rates.

We know that both violence, and the neighbourhood characteristics that predict violence, are non-randomly clustered in space (Anselin et al. 2000; Messner et al. 1999). Perhaps more importantly, numerous studies have found that the non-random clustering of violence is *not* fully accounted for by the non-random clustering of poverty and other predictor variables, nor is it accounted for by the non-random clustering of unmeasured independent variables. Instead, "...homicide events in one place actually increase the likelihood of homicides in nearby locales" (Baller et al. 2001: 567). This is true to the extent that a spatial lag is identified as a significant predictor of neighbourhood homicide rates in spatial models.

The typical interpretation of a spatial lag effect is that it represents some process of diffusion of violence across space. That is, neighbourhoods that are geographically

proximal to neighbourhoods with high rates of violence are themselves at increased risk of violence. Thus, homicide diffuses across neighbourhood boundaries. Two types of diffusion across neighbourhood boundaries have been identified in the literature: *expansion* and *relocation* diffusion (Cliff et al. 1981; Cohen and Tita 1999). The assumption underlying both processes is one of contagion whereby contiguity of tracts, or geographic exposure to nearby neighbourhoods, is necessary for diffusion to occur. *Expansion diffusion* is implied if homicide emanates outward from the neighbourhoods with the highest levels of violence. For this type of diffusion, violent neighbourhoods remain violent over time. By contrast, *relocation diffusion* is implied if homicide moves across the city such that adjacent neighbourhoods experience higher rates of homicide over time but the point of origin “cools off.” In this latter case, new and different neighbourhoods assume the status of the most violent neighbourhoods in the city. To the extent that homicide diffuses across neighbourhoods, the spatial distribution of homicide within cities is expected to change over time.

### **1.5 UNRESOLVED ISSUES**

The consistency with which space matters for predicting violence in America, at various geographies, indicates the importance of extra-local factors for explaining the distribution and spread of homicide. However, the extant literature on the spatial distribution of homicide, as well as the arguments underlying diffusion processes has not fully addressed two important issues. First, while the geographic location of neighbourhoods in cities has been identified as important for explaining internal levels of homicide, little research has been directed at examining the neighbourhoods to which

homicide is most likely to diffuse. That is, understanding where homicide diffuses to is necessary in order to determine what features constitute either barriers or vulnerabilities to its diffusion.

Second, the diffusion of homicide must occur over time. If neighbourhood boundaries are permeable to violence occurring immediately outside their borders, then it naturally follows that there will be some temporal variation in the spatial distribution of homicide in cities. However, current methodologies are unable to incorporate spatial and temporal effects simultaneously. Thus, exploring processes of diffusion over five decades in Buffalo provides an opportunity to examine how the spatial distribution of homicide changed, and more specifically, what characteristics made neighbourhoods vulnerable to the diffusion of homicide. This approach extends the current focus on predicting internal neighbourhood homicide rates based on the spatial location of neighbourhoods to explaining the clustering of neighbourhoods that are vulnerable to the diffusion of homicide over time.

## **1.6 A CASE STUDY APPROACH: BUFFALO, NEW YORK**

Choosing Buffalo as a case study for an historical examination of neighbourhood influences on the spatial distribution of homicide contributes to the literature on the decline of manufacturing cities in the post-industrial era. Buffalo is a city marked by severe racial segregation, a dwindling economic base, increasing unemployment, rapid depopulation, and rising homicide rates between 1950 and the end of the twentieth century. Detroit, Pittsburgh, St. Louis, and Cleveland, like Buffalo, were all once heavily involved in industrial manufacturing, and began to lose those economic bases in the

1960s and continuing through the 1970s and 1980s (Eisinger 2003; Koritz 1991; Kraus 2000; Sugrue 1996). An out-migration of the population, increased suburbanization, high unemployment, and overall economic decline have characterized many of the industrial 'rustbelt' cities of the north-eastern and Great Lakes region of the United States, with some cities finding a way to rebound into the financial and technological sectors more fully than others (Sugrue 1996; Wilson 1987). While previous studies on some of these larger industrial cities provide a basis for comparison given their past reliance on manufacturing, there is reason to suspect that Buffalo's experience over the postwar period is unique. For example, Taylor (1991) argues that the social transformation process that resulted in the formation of the black ghetto in Chicago (Wilson 1987) did not occur in the same way in Buffalo during the 1970s. Instead, as the black population grew in Buffalo, and expanded to a greater number of neighbourhoods, the majority of these neighbourhoods were cross-class communities containing

...a variety of social and economic organizations including churches, neighborhood block clubs, community-based organizations, cultural groups, youth centers, civil rights organizations, educational institutions, social clubs, formal and informal political organizations, ...research institutions, ...[and] "cultural" businesses such as bars, restaurants, beauty parlors, and barber shops that serve as important "meeting" places for African Americans (Taylor 1991: 601).

A case study of Buffalo allows for a more nuanced and contextualized analysis of neighbourhood change and homicide than has been possible with either cross-sectional analyses of neighbourhoods in one city or longitudinal analyses of multiple cities. The benefit of studying multiple cities is an ability to generalize one's results. Generalizability of this sort has its limitations, however. First, one typically does not know the extent to which the average effects across an entire sample represent the

specific experiences of different cities in the sample. Second, studies which take cities as their units of analysis cannot examine how processes of change at the neighbourhood level play out to, ultimately, produce city-level effects. While there is value in the generalizability of results obtained from research on multiple sites, the trade-off with these types of studies is a loss of in-depth historical context framing the research and findings. It is this depth in historical context that is an advantage of the current research.

Additionally, while studies examining neighbourhood effects were abundant prior to the 1950s, it has only been in the 1990s that neighbourhood-level research has resurfaced using advanced multilevel and spatial methods (Sampson, Morenoff, and Gannon-Rowley 2002). The lull in neighbourhood-level research during the critical post WWII period is disappointing, because it was during this period that neighbourhoods experienced rapid and profound change. The emergence of large-scale public housing developments, social welfare reforms, civil rights legislation, the post-industrial economy, as well as women's movement into the paid labour market, and heightened residential segregation in urban areas all commenced in the 1960s, and it is precisely these developments that have been repeatedly pointed to as correlates and/or causes of increases in urban violence (Sampson and Morenoff 1997). The growth of the ghetto poor and urban renewal initiatives – some with disastrous consequences – were also products of the years between 1950 and 1970 (Jacobs 1961; Wilson 1987). Yet, often for lack of available data, empirical research has neglected to examine the spatial distribution of violence in neighbourhoods across the entire postwar era.

As a rustbelt city that boomed through WWII, but experienced significant decline thereafter, a case study of Buffalo provides a unique opportunity to contextualize the

relationship between neighbourhoods and urban violence. Unlike much of the research on neighbourhoods and crime that focuses on mega-cities, this study will delve into the processes of urban change and homicide in a medium-sized industrial city over the post WWII period through the end of the twentieth century. While the history of Buffalo, including transportation planning, public housing construction, depopulation, and racial segregation will be explored, many of these processes characterize other north-eastern U.S. urban centres. Therefore, the findings of this research may be germane to the diffusion processes unfolding in other American cities over the same period.

### **1.7 THE SCOPE OF THIS STUDY**

The research in this dissertation contributes to a burgeoning literature on neighbourhood effects. Using a detailed, historical case study approach, I provide a comprehensive account of how and why homicide affected certain neighbourhoods in Buffalo between 1950 and the end of the twentieth century. This focused examination on neighbourhood change within the context of citywide and larger societal transitions provides the advantages of rigorous quantitative analyses while retaining the benefits of qualitative depth. For instance, the relationship between neighbourhood characteristics and homicide that I undertake is embedded within the backdrop of: 1) large-scale societal changes including school desegregation, the rise of impoverished and concentrated public housing developments, and the movement to a post-industrial economy that left cities driven by manufacturing behind; and 2) transitions particular to Buffalo's experience in the postwar era including unique residential segregation and (im)migration patterns. This



attention to change over five decades provides the key to understanding the spatial distribution of homicide across neighbourhoods in the city of Buffalo.

The remainder of this dissertation proceeds as follows. In Chapter 2, I provide a brief history of Buffalo between 1950 and 1999. This historical backdrop sets the stage for a quantitative analysis of citywide changes in demographic, socioeconomic, and housing characteristics that comprises Chapter 3. Citywide trends can mask substantial variation among neighbourhoods, however. Thus, I provide a detailed examination of neighbourhood trends in Buffalo, focusing in particular on how variations in neighbourhood characteristics were associated with levels of neighbourhood homicide over five decades in Chapter 4. Here I also introduce a social ecological approach to determine how homicide was distributed in space, and whether patterns in the distribution of homicide across neighbourhoods varied over time.

Given the extended time frame featured in this study, in Chapter 5 I conduct an assessment of how the characteristics that define neighbourhoods are interrelated. This is important for quantitatively analysing the internal predictors of neighbourhood homicide levels, as well as the characteristics that increase vulnerability to the diffusion of homicide from surrounding neighbourhoods. Finally, Chapter 6 follows with an in-depth examination of how neighbourhood characteristics matter for producing homicide, whether the factors contributing to neighbourhood homicide rates change over five decades, and how geographic proximity, combined with internal neighbourhood characteristics, functions to modify the vulnerability of neighbourhoods to the diffusion of homicide. I conclude this study in Chapter 7 with a discussion of key theoretical and

policy implications, as well as directions for future research on neighbourhoods and violent crime.

## **CHAPTER II. AN ABBREVIATED HISTORY OF BUFFALO**

In this chapter, I provide a brief history of the city of Buffalo, focusing primarily on the decades following World War II through the end of the twentieth century. This historical overview serves as a backdrop to later analyses, and aids in the interpretation of those analyses within the larger social and historical context of the city. I argue that a serious critique could be levied at social ecological studies to the extent that they neglect the larger social context of the urban areas they study. Therefore, in this chapter I chronicle socioeconomic trends that have characterized Buffalo over time, the history of race relations in the city, and urban renewal initiatives, such as public housing construction, that have modified the physical and social spaces of neighbourhoods. Where relevant, I note how politics in Buffalo, both municipal leadership and neighbourhood grassroots movements, influenced neighbourhoods in the city. While not a focus of my dissertation, politics has played a role in initiating and impeding urban renewal plans, in altering housing markets, and in influencing race relations in Buffalo.

Buffalo is a city that has undergone massive social and economic transformations over the postwar period. Like other industrial cities, particularly those in the north-eastern United States, Buffalo's economic base, comprised primarily of industrial manufacturing, crumbled in the post-industrial era. The city experienced an extensive decline in total population – a reduction of almost half between 1950 and 1999 – underscored by transitions in the racial and ethnic composition of residents. These social and economic transformations in Buffalo were, however, unevenly felt across neighbourhoods in the city. As expected, some neighbourhoods were able to mobilize and resist changes that may have resulted in their deterioration, while others were more

vulnerable to both widespread changes in the economy and official urban planning initiatives. Some neighbourhoods were successful at defending their interests, while others were not. This highlights the importance of understanding the changes and continuities experienced in Buffalo's neighbourhoods over five decades.

In the remainder of this chapter I provide a brief overview of Buffalo in the early twentieth century, prior to and including both World Wars. I follow this with a short discussion of my motivation for choosing the 1950 to 1999 period as the time frame of the current research. In the remaining three sections of Chapter 2, I focus on: 1) socioeconomic changes; 2) race relations; and 3) housing and urban renewal initiatives affecting Buffalo between 1950 and the end of the twentieth century. A reference map of Buffalo's neighbourhoods is provided in Figure 2.1.

## **2.1 THE EARLY TWENTIETH CENTURY IN BUFFALO**

At the turn of the twentieth century, Buffalo was the eighth largest city in the U.S. with a population of 352,387 residents<sup>7</sup> (Gibson, 1998). It was a city that had already established itself as a post for the Underground Railroad in the mid-1800s, an Irish, Italian, German, and Polish immigrant destination due to its thriving steel mills and grain industry, and the birthplace of electric lighting harnessed from the hydroelectric power generated by Niagara Falls. Due to its growing economy and population, Buffalo was chosen as the site of the 1901 Pan-American Exposition during which President William McKinley, a supporter of laissez-faire capitalism (Harring 1985), was assassinated. President Theodore Roosevelt swore the oath of office on September 14<sup>th</sup> 1901 in

---

<sup>7</sup> One marker of the dramatic fall of Buffalo is illustrated by the fact that it was one of very few American cities to have fewer residents in 2000 (292,648) than it did in 1900 (352,387). By 2000, Buffalo had fallen to the 57<sup>th</sup> largest city in the U.S.

Buffalo, the day McKinley passed away. McKinley's assassin, Leon Czolgosz, a Polish steelworker from Cleveland, was executed shortly thereafter on October 29<sup>th</sup> 1901 (Goldman 1983; Harring 1985).<sup>8</sup>

Despite a number of strikes and rising unemployment in the early years of the twentieth century (Powell 1988), Buffalo's economy improved immediately upon the entry of the United States into World War I. During this period, the employment rate was high, often exceeding the rates in other parts of the country, because the city was heavily involved in steel and munitions manufacturing, as well as other wartime production industries. At that time, Buffalo was also a major port city for ocean-going vessels and ships travelling on the Great Lakes through the Erie Canal, which linked the port of New York City on the Hudson River to Lake Erie. As such, Buffalo became the nation's largest grain storage port (Goldman 1983).

The romantic notion of peaceful, integrated, organized neighbourhoods, though certainly exaggerated, did have some basis in reality in Buffalo prior to the 1950s. Employment was high, particularly during both World Wars, rates of homicide were low and stable, women had not made significant inroads into the labour market so houses and neighbourhoods were occupied during the daytime, and transportation was not cheap or convenient so local shops and restaurants were frequented by neighbourhood residents (Goldman 1983; Kraus 2000; Taylor 1991). Many of these neighbourhoods could be characterized as ethnic enclaves with traditional restaurants, bakeries, grocery stores,

---

<sup>8</sup> Harring (1985) poignantly argues that, early in the twentieth century, Buffalo was a heterogeneous city comprised of heterogeneous political interests. He takes issue with Goldman's (1983) "anecdotal" review of the decline of Buffalo by insinuating that a great deal of class consciousness and conflict existed between the elites of Buffalo and the city's labour interests even in this early period. Czolgosz's status as a Polish immigrant steelworker is significant given Harring's discussion of the socialist rallies and speeches that were held in Buffalo's predominantly Polish East Side neighbourhood, Polonia.

social institutions, and other businesses servicing ethnic residents (Goldman 1990; Taylor 1991). Newspaper production early in the twentieth century dramatically illustrates this heterogeneity; one Polish, one Italian, and four German local weekly papers were published, in addition to upwards of six English-language newspapers (Powell 1988).

Ethnic enclaves were spatially organized across the city, where Italian immigrants dominated Buffalo's *Lower West Side*, the *West Side* and *Allentown* districts, and the Irish congregated in the *First Ward* district and in *South Buffalo* (see Figure 2.1). A large Polish community resided in the *Black Rock* and *Polonia* areas of Buffalo, whereas the Germans settled in the *Masten* district through the *Broadway/Fillmore* vicinity. The small African American population residing in Buffalo prior to WWII lived in an integrated community in the *East Side* called the *Ellicott* district (Kraus 2000; Taylor 1991). Adding to a vibrant combination of ethnically diverse neighbourhoods, race relations were positive during this period. Buffalo was the site of safe houses on the Underground Railroad during the nineteenth century (Goldman 1983), unlike other cities there had been no major race riots in Buffalo through the first half of the twentieth century (Wolcott 2006), and in 1924 Buffalo's Mayor F.X. Schwab posted a list at City Hall of suspected KKK members in the area under the title "Exposé of Traitors in the Interests of Jews, Catholics, Negroes and all Respecters of the American Principle of Civil and Religious Freedom."<sup>9</sup> Living up to its nickname, Buffalo was indeed *The City of Good Neighbors*.

---

<sup>9</sup> A copy of this historic document is available at the Buffalonian.com website: <http://www.buffalonian.com/history/articles/1901-50/kkk/kkk.html>, accessed July 21, 2006.

## 2.2 POST WWII: THE PERIOD COVERED BY THIS STUDY

The period examined in this study takes 1950 as its starting point and extends through the end of the twentieth century. I have delimited the time period under examination to the latter half of the twentieth century (1950 through 1999) for two important reasons. First, as demonstrated above, Buffalo was a prosperous and growing urban centre prior to the end of WWII. It was at this point that Buffalo began to decline both in population and in economic prosperity, and it was over this latter period that racial relations transformed as well. The worsening socioeconomic conditions, coupled with a shifting demographic composition and problematic urban renewal initiatives in Buffalo provide the larger social and historical context for examining changes in the spatial distribution of homicide across Buffalo's neighbourhoods.

Second, like other cities in the United States, homicide rates in Buffalo slowly increased in the 1950s, before rising dramatically in the mid-1960s.<sup>10</sup> The unprecedented increase in homicide in the 1960s was entirely uncharacteristic of the low and relatively stable quantity of homicide in the first part of the century, both in Buffalo and more widely across the United States (Blumstein and Wallman 2000). By using 1950 as a starting point for my analysis, I am taking advantage of a natural change-point in the prosperity of the city which preceded changes in overall homicide rates beginning in the 1960s. These transitions – differentially experienced by neighbourhoods nested within an industrial city, and extending from a period of prosperity through its dramatic decline in the post-industrial era – justify narrowing the scope of the analyses to the latter half of the twentieth century.

---

<sup>10</sup> Homicide trends in Buffalo are discussed more fully in Chapter 3 (see Figure 3.13).

### 2.3 SOCIOECONOMIC CHANGES IN BUFFALO

After the industrial boom of WWII, Buffalo's economic future became more uncertain. With the opening of the St. Lawrence Seaway in the late 1950s, ships were able to travel a less circuitous route than that of the Erie Canal, which meant that they could bypass Buffalo altogether. This resulted in the loss of grain storage, shipping, and most waterfront industries. According to Goldman (1990: 170)

...[f]or a while Buffalo's grain industry was able to hang on. In 1960 the city's six milling companies – General Mills, Pillsbury, Peavey, Standard Milling, International Milling, and George Urban – were so productive that more than a third of the population of the United States used flour or flour products milled in Buffalo. But by the mid-1960s Buffalo's grain business began to hurt. In 1966 alone five flour mills were shut, and in 1981 Standard Milling, a Kansas City-based company, closed the largest mill in the city. Such was the legacy of the St. Lawrence Seaway.

Despite these worsening prospects in the grain industry, manufacturing remained Buffalo's largest industry during the 1950s and 1960s. For example, in 1950, 45 percent of the workforce in Buffalo was involved in manufacturing (Kraus 2000). Yet even the future of this sector was tenuous, given the impending disinvestment in America's core manufacturing industries (Brady and Wallace 2001; Harrison and Bluestone 1990).<sup>11</sup> Owned largely by national conglomerates rather than by locals, a number of major employers either shut down or scaled back their operations in Buffalo as early as the 1950s. Some of these companies included Spencer-Kellogg, DuPont, American Shipbuilding Company, and locally-owned National Aniline (which had been subsumed under a non-local parent company, Allied Chemical and Dye Corporation, during the 1920s), among others (Goldman 1983). The impact of these changes resulted in

---

<sup>11</sup> Indeed, the proportion of the population employed in manufacturing in Buffalo had declined to 16 percent by 1990 (U.S. Census Bureau, Census 1990 SF3) and 13 percent by 2000 (U.S. Census Bureau, Census 2000 SF 3).



worsening employment rates in Buffalo relative to those of the remainder of Western New York and to the nation. However, the economy improved for steel and automobile manufacturing during the 1960s, stimulated largely by spending on the Vietnam War. In 1960, these two industries alone claimed slightly more than half of all private-sector employees in the city (Goldman 1990).

By the 1970s, however, the situation reversed. Deepening economic crises in the steel and auto industries caused massive layoffs in Buffalo and, between 1960 and 1990, retail and manufacturing establishments located in the city declined by 100 percent relative to the rest of Erie county (from 66 percent of retail and manufacturing establishments located in the city of Buffalo relative to the entire county in 1958, to 31.6 percent in 1987) (Institute for Local Governance and Regional Growth 2000). Given Buffalo's reliance on the industrial economy, unionization levels among local labourers were high. Whalen (1987: 764) shows that the Buffalo "...area's union penetration rate was about four times the national norm during the 1970s." This, he says, led to some of the most heated labour conflicts in the nation. Indeed, between 1970 and 1975, during a period when over 30,000 manufacturing jobs were lost, the Buffalo Standard Metropolitan Statistical Area was surpassed by only two other SMSAs in the amount of working time lost due to organized labour conflicts (Whalen 1987). In some ways, this extensive unionization exacerbated the problems for employees in Buffalo such that non-local owners and corporate executives perceived Buffalo to be a 'bad labour town.'

Jacobson's (1984) data show that the depressed labour market in Buffalo during the 1960s and 1970s was most problematic for displaced workers in the durable manufacturing sector. Manufacturing employment accounted for half of the workforce in

Buffalo at the time, with two-thirds of those located in durable goods manufacturing. Those displaced from these jobs "...suffer[ed] large earnings losses that [did]...not diminish over time" (Jacobson 1984: 569; see also Gerhart and Jarley 1987); and by 1982, the once major employers General Motors, Ford, and Bethlehem Steel were operating with little more than skeleton workforces (Goldman 1983). Unfortunately, growth in the service and high-tech industries was slower in Buffalo than in other rustbelt cities, including Detroit and Pittsburgh, which meant that jobs lost due to the manufacturing decline were not being replaced by opportunities in other sectors (Kraus 2000).

In an article published in the February 9, 1975 edition of the *New York Times*, Buffalonians spoke about the employment crises facing residents of the city. For instance, Jean Megna, a married woman with four children explained her situation this way:

...I just don't know where to look anymore for work. I really don't. I've been checking the papers, trying to see if there is anything I could do...and I could get a job in New York just like that. But here, God, this place! This place is terrible. I can't get anything here (*New York Times*, February 9 1975).

Lewis Hawkins, a 28-year old concrete finisher on the unemployment line indicated his frustration with Buffalo's stagnant economy this way:

...There's going to be a lot of stealing, a lot of mugging and everything...People are going to get tired, tired of coming down here and standing in line...And when they finally get unemployment, a person who, say, only gets \$45 or \$50 a week might have three or four children; before a man's going to see his children and his family go hungry, it seems he's going to go out there and do something (*New York Times*, February 9 1975).

The serious economic problems in Buffalo resulted in extensive poverty among city residents, with one quarter (25.6 percent) of the population of Buffalo officially living below the poverty line by 1990, double that of the region. Poverty disproportionately affected the African American population, and by 1990, fully 38 percent of black residents lived in poverty (1990 Census of Population and Housing, STF3).<sup>12</sup> The racial disparity in rates of poverty even at the end of the twentieth century is perhaps not surprising given that racial discrimination in employment began decades earlier. One of Buffalo's largest employers, Bethlehem Steel Company, was the target of a federal civil lawsuit in 1967 for "...discrimination in the hiring and promotion of African-Americans" (Goldman 1990: 114). As the economic situation for all Buffalonians worsened between 1950 and the end of the twentieth century, African Americans in Buffalo were hardest hit.

#### **2.4 RACE RELATIONS IN BUFFALO**

Between 1950 and the end of the twentieth century, the population of the city declined drastically from approximately 550,000 in 1950 to just under 300,000 by 2000. White residents left the city in record numbers and settled in the suburbs, at the same time as African Americans were migrating northward from southern U.S. states (Wolcott 2006). Between 1950 and 1999, the black proportion of the population increased from about 6 percent to more than 35 percent.

---

<sup>12</sup> This trend continued unabated, and by 2000 the relative situation had worsened for African Americans in Buffalo. The overall poverty rate had climbed marginally from 1990 to just below 27 percent, however 48 percent of African Americans in Buffalo were living below the poverty line by 2000 (2000 Census of Population and Housing, SF 1, SF2, SF 3, and SF4).

Despite growing more racially heterogeneous, however, residential segregation was and continues to be a serious problem for Buffalo, which is one of only 16 *hypersegregated* cities in the United States (Massey and Denton 1993). On the East Side, the Ellicott district and, more recently, the Masten district serve as virtually the only two districts in the city with African American residents (see Figure 2.1). In fact, by 1990 fully 84 percent of African Americans in Erie County lived within Buffalo's city limits, and of these, 90 percent were concentrated on the East Side (Kraus 2000; Institute for Local Governance and Regional Growth 2000). More recently, Buffalo's Lower West Side became a destination for many Latino/a immigrants originating in Puerto Rico, but the extent of residential segregation suffered by the Latino population is far exceeded by the segregation experienced by Buffalo's black population.

Buffalo was a city experiencing transitions in both racial composition and racial relations in the postwar period. For instance, in the years immediately following WWII race relations in Buffalo were generally positive. In a 1951 address to Buffalo's Urban League, Dr. Ira D. Reid, the first black professor of sociology at Haverford College, suggested that "...Buffalo...[was] unexcelled in the nation with respect to co-operation between the community and industry in surmounting racial barriers" (*Buffalo Courier Express*, April 21 1951).<sup>13</sup> Nonetheless, increases in the proportion of African Americans settling on Buffalo's East Side during the 1950s resulted in an uneasy tension between Buffalo's largely Caucasian ethnic groups and the new African American migrants.

---

<sup>13</sup> This historic article from the *Buffalo Courier Express* is provided by the Buffalonian.com at (<http://www.buffalonian.com/hnews/1951buftopsinracialcoop.htm>), accessed April 2002.

The spatial organization of Buffalo's racial and ethnic groups into distinctive neighbourhoods likely contributed to cross-group tensions in what was a liberal city, known for its progressive civil rights legislation. While legal segregation was prohibited in Buffalo during the 1950s, Wolcott (2006) shows that de facto segregation existed in public, and therefore contested urban spaces. In 1956, racial tensions came to a head in Buffalo at the Crystal Beach amusement park located on the shores of Southern Ontario (Goldman 1990; Wolcott 1996). On that Memorial Day in 1956, Buffalo's black and white youth boarded the *Canadiana* ferry bound for Crystal Beach. Escalating feuds between youth visiting the park, which increasingly involved skirmishes between black and white youth, resulted in a handful of minor injuries and arrests. On the last ferry to leave the park, continued fighting ensued, resulting in local and national news coverage of Buffalo's 'race riot' (Wolcott 2006). While there were few injuries, and the incident could arguably be described as minor, it ignited simmering tensions in Buffalo between African American youth on the East Side struggling to assert their rights as full and equal citizens, and white ethnic groups that had staked claim to the remainder of the city's neighbourhoods. The consequences of the Crystal Beach incident were far more serious than the skirmish on the *Canadiana* would have warranted. African American teenagers came to represent the "...dangers of urban life" (Wolcott 2006: 72) to Buffalo's white majority, who increasingly abandoned the city for the suburbs and/or thwarted racial integration in urban neighbourhoods.<sup>14</sup> The segregation (Massey and Denton 1993) of African Americans in the East Side began in earnest during the 1950s.

---

<sup>14</sup> Wolcott (2006: 66) connects the event at Crystal Beach with white flight by suggesting that ...[w]ell before white families decided to leave cities such as Buffalo for nearby suburbs, there was among whites a palpable fear of the threat of black youth gangs and

Racial tensions continued through the early 1960s in Buffalo. In 1966, for example, a Buffalo policeman was investigated by the Commission on Human Relations regarding a shooting that resulted in the fatality of an unarmed black youth (Halpern 1974). The investigation sparked anger between the police department, who maintained that such investigations should be dealt with internally, and the Commission. Halpern (1974: 569) found that the dispute sparked a defensive response among city councilmen, with two councilmen "...promis[ing] investigations of the Commission's 'illegal attack on a Buffalo policeman.'" This was the last police-involved shooting investigated – and made public – by the Commission (Halpern 1974).

Less than one year later, between June 27<sup>th</sup> and July 1<sup>st</sup> 1967, the East Side erupted in an urban race-related riot (Goldman 1990). Prompted by a small group of African American youth smashing car windows and vandalizing storefronts, police, who had been dispatched to the East Side, fired tear gas at participants and bystanders to quell the disturbance. The rioting escalated over night and into the next day where fires were set to buildings, windows were broken, and African American youth 'gangs' taunted police, threw rocks at passing vehicles, overturned cars, and looted stores (Goldman 1990). A report on the riot in Buffalo, issued by the Store Front Education Information Centers,<sup>15</sup> indicated that

...In viewing the Buffalo riots, it is difficult at most, if not impossible, to pinpoint the initiating spark. If anything, the outburst may be attributed to long periods of frustration. As one young Negro youth explains, "we jus' tired of bein' lied to, that's all." For a long time the people have remained disgruntled about the poor housing and jobs with no future. In seeking answers, they have been told that poverty programs, city, state, and

---

rising delinquency. By fomenting this fear, the black teenagers who integrated amusement parks helped initiate white flight.

<sup>15</sup> A reproduction of the original report is available at <http://www.buffalonian.com/history/articles/1951-now/1967riots/index.html>, accessed July 2006.

Federal, would help them out of their ghetto. None have worked as yet and the city continues to make similar idle promises.

In response to the lack of adequate housing and employment opportunities, the African American community in Buffalo responded in the only way that they felt the city would take notice. Complicating matters, Mayor Sedita promised to open 3,000 new jobs to African Americans on the East Side in an effort to end the rioting. The result of this promise, however, had the unintended consequence of raising suspicions about the city's administration. That is, if such jobs were mysteriously created after the riot, why had they not been offered as a remedy to the community's problems before a riot was necessary (see fn. 9)? The 1967 riot in Buffalo was not unique. African Americans in disadvantaged and segregated neighbourhoods in other cities in the north-east also rioted in response to employment discrimination, segregation, and inadequate housing during 1967 and 1968 (Sugrue 1996). A few months after the 1967 riot in Buffalo's East Side, Dr. Martin Luther King Jr. visited the city and argued that while he disapproved of rioting to satisfy the African American community's objectives, he understood that "...disappointment breeds despair; despair leads to bitterness, and where there is bitterness an explosion will develop" (*Buffalo Courier Express*, November 10 1967).<sup>16</sup>

Through the end of the twentieth century, Buffalo continued to be a city demarcated by racial and ethnic neighbourhoods. In the same *New York Times* (February 9, 1975) article lamenting the unemployment rate in Buffalo, one 27-year old, white, male resident clarified the degree to which Buffalo maintained segregated neighbourhoods:

---

<sup>16</sup> A copy of this article is available at <http://www.buffalonian.com/hnews/1967mlkinginbuffalo.html>, and was accessed in April 2002.

...I'm not too happy about the possibilities of belonging to the lower socioeconomic group, being poor. But something's got to come up: I'm not terribly worried. And Buffalo's a pretty good place to be. I've heard a lot of things said about Buffalo – armpit, etc. – but it's pretty good. It's comfortable, in general, and you've got the neighborhoods still intact, unassimilated, still having very individual flavors.

This persistent residential segregation in Buffalo by racial and ethnic groups, coupled with a high poverty rate among the African American population, meant that East Side neighbourhoods were differentially affected by low socioeconomic status and other economic and social dislocations that continue to affect the city. As the income gap widened between African Americans and whites over the 1970s and 1980s, the proportion of African Americans living below the poverty line deepened. In fact, Buffalo lagged behind only Newark and Miami in having the highest proportion of African Americans living in poverty by 1980 (Taylor 1991). Despite the socioeconomic problems in Buffalo's East Side, Taylor (1991) argues that the majority of middle-class African Americans remained in or near the East Side neighbourhoods during the 1970s and 1980s, contributing to the social organization, religious life, culture, and businesses of the larger African American community.

## **2.5 HOUSING AND URBAN RENEWAL**

Like other industrial cities in the northeast, the 1950s and 1960s in Buffalo were years punctuated by well-intentioned but ultimately destructive urban renewal efforts. Federal legislation allowed the city to implement urban policies that would transform Buffalo's physical and social landscape. Transportation planning, land-use zoning, housing construction and other urban renewal initiatives stimulated, and in some cases, forced the relocation of residents, altering the racial, ethnic, and class composition of



neighbourhoods in the city (Kraus 2000; Price 1991). Sparked by the 1934 National Housing Act, the Federal Housing Authority created new avenues for home ownership through mortgage loans (Price 1991). This, combined with the GI Bill, helped to finance housing options in both race-segregated public housing in the city, and to stimulate home ownership for whites and returning veterans in the suburbs.

Urban renewal created new difficulties for displaced African Americans who had been living in the Ellicott district in the 1940s and 1950s. They were forced to relocate into the Fruit Belt or even further north into the Masten district by 1953, and then return to the Ellicott district to occupy high-rise, concentrated public housing developments in the form of Ellicott and Talbert Malls in the late 1950s. This displacement from the Ellicott district affected both African American families and businesses that had served as the "...backbone of the black community" (Wolcott 2006: 79). The siting of these two large-scale public housing developments in the Ellicott district was a consequence of successful opposition to proposed sites in both North and South Buffalo, primarily white neighbourhoods (Kraus 2000). The Ellicott and Talbert Malls were constructed on the East Side, only three blocks away from one another.<sup>17</sup> The new neighbourhood, which consisted largely of high density housing for the poor, was unable to attract new business development (Price 1991). Moreover, the value of land plummeted in the Ellicott district. Land values in the downtown core reached \$75.00 per square foot in 1973, but ranged from \$0.00 to \$0.29 per square foot in the bordering Ellicott district, according to a report generated by the Greater Buffalo Development Foundation (Price 1991).

---

<sup>17</sup> Similar public housing developments were set up in cities across the country, concentrating the black community in poorly designed projects that thwarted the informal surveillance efforts of residents (Jacobs 1961).

These decisions about urban planning were made at the expense and without the input of the black community. Wolcott (2006) shows that the governing body of the city, Buffalo's Common Council, included only one African American member through the 1950s. Similarly, the Buffalo Municipal Housing Authority first included an African American representative in 1958 (the same year that construction of Elliott and Talbert Malls was completed), and the Board of Redevelopment, which oversaw urban renewal initiatives, first included an African American representative in 1960. According to Wolcott (2006: 88), "...the planning and building of Buffalo's public housing and redevelopment projects took place under the aegis of the white power structure."

Housing markets in urban areas help to determine who lives in neighbourhoods and how desirable neighbourhoods are. As Laska and her colleagues (1982: 156) observe, urban neighbourhoods are contested terrains such that "...the spatial distribution of social classes takes note of the qualities of the valued locations within the city and the differential abilities of the social classes to compete for them." In Buffalo, as elsewhere, the Housing Act of 1949 gave municipal governments a broad range of powers to condemn parcels of land as in need of urban renewal under the guise of slum clearance. The primary strategy to deal with housing options for returning veterans in need of affordable housing, and for those in poverty, involved the construction of government-subsidized public housing. While the intention of construction was to provide housing to those who could not afford adequate shelter, the obvious side-effect was the concentration of the exceptionally poor at high densities in large developments, often without the input or the influence of those who would eventually reside in those developments.

This clustering of low-income, subsidized housing in very few neighbourhoods has been the normative way to organize public housing developments in many large U.S. cities including Chicago and Los Angeles (Dreier, Mollenkopf, and Swanstrom 2001). Proponents of siting public housing in poor neighbourhoods argue that slum clearance precedes construction, contributing to positive forms of urban renewal. Others argue that the lack of influence and public control held by residents of poor neighbourhoods makes them powerless to resist the imposition of such developments (Bursik and Grasmick 1993). Such was the case in Buffalo's East Side.

In the 1950s, urban renewal plans affected not only the Ellicott District on the East Side, but also large portions of the Lower West Side (Kraus 2000). At that time, the Lower West Side was home to a thriving Italian community where, according to a local newspaper at the time, "...gardens and fruit trees flourish and the interiors of the homes were well kept and comfortably furnished" (*Buffalo Courier Express*, June 1966 as cited in Goldman 1990: 29). In 1966 clearing began and "...the neighbourhood disappeared at a rate of a hundred homes a month" (Goldman 1990: 29). The land then remained vacant for two years. Goldman (1990: 30) provides an illustrative explanation:

...The [urban planning] company would build an entire community between Niagara Street and the Niagara River, a mixed-use development for ten thousand people with a school, recreation facilities, and high- and low-rise apartments for moderate and low-income subsidized housing. There was something thoughtless, tasteless, even obscene about the language the Urban Development Corporation used to describe its project, as if nothing, let alone a community that had struggled to stay alive, had ever been there before...Today the project sits there. "The Shoreline," it is called. Clustered, sand-coloured concrete buildings...it is surrounded, as anyone who had read Jane Jacobs knew it would be, by grass fields and common areas: an empty, concrete suburban development in the heart of the city, where once there had been a neighbourhood.

Buffalo's city council was also making decisions during the 1950s and 1960s about transportation planning for the coming decades when, they erroneously predicted, the booming Central Business District would be surrounded by an ever-growing suburban fringe. While the suburbs expanded well into the 1970s, Buffalo's city council could not have envisioned they would be as self-contained and independent from the city as they turned out to be (Goldman 1983). Plans were made for the construction of five super-highways to cut through Buffalo in the early 1950s (Goldman 1990). The deleterious effects that this construction had on some Buffalo neighbourhoods were recognized only after the damage had been done. One of the proposed highways was slotted to run directly through the West Side, and arrangements for construction began in the 1960s. In preparation for these events, previous homeowners abandoned the area and, in the late 1960s, Puerto Ricans moved in. They effectively built a neighbourhood out of the vacant homes, abandoned buildings, and empty lots that had been razed for slum clearance during the mid-1960s (Goldman 1990). After extensive lobbying by the Lower West Side Puerto Rican community association and eight citizen task forces created during neighbourhood meetings, plans for the highway were finally abandoned in 1976 (Goldman 1990). This was clearly a success for residents on the Lower West Side.

The neighbourhood of Humboldt Parkway, just north of the Ellicott district on the East Side, was not so lucky. Construction of the six-lane arterial began in 1958, splitting the integrated, middle-class neighbourhood (Goldman 1990). Hundreds of residents were dislocated and the neighbourhood was effectively partitioned. Many of those who had been displaced from their homes due to plans for arterials and smaller transportation routes through existing neighbourhoods were given priority in the newly constructed

public housing (Carter et al. 1998; Friedland 1982; Logan and Molotch 1987). Yet, as I indicated above, this option produced its own problems. These urban renewal initiatives, in addition to realtor blockbusting<sup>18</sup> in the private housing market, succeeded in moving white residents out of, and confining African Americans to East Side neighbourhoods. The overall effect was to intensify the segregation of African Americans on the East Side, and severely disrupt the black community in Buffalo as a whole.

In an effort to stimulate a stagnating city, with a declining tax base due to suburbanization, Buffalo's city council made a number of failed attempts at revitalizing the downtown core. One such attempt involved decisions about where to locate the new State University of New York at Buffalo campus during the 1960s. SUNY at Buffalo was eventually constructed in the Northern suburb of Amherst, rather than along the downtown waterfront because, according to Haring (1985: 83), Buffalo's suburban middle-class and elites were "...still afraid of the dark figures of the 'East Side'..." who resided entirely too close to the waterfront. Plans for downtown revitalization through government-subsidized construction of office buildings and hotels in the 1970s and 1980s stalled, making Buffalo

...increasingly insignificant as a retail center, surrounded by desperately poor communities of blacks, Hispanics, and whites[;] downtown, now hardly more than a besieged daytime fortress of office buildings, stood at the brink of total disaster (Goldman 1983: 285).

---

<sup>18</sup> Sugrue (1996) offers a compelling description of the actions of "blockbusting" realtors in Detroit. There were tremendous economic opportunities open to realtors who would play on the insecurities of white residents and purport to offer opportunities to black residents who sought to vacate the inner-city ghetto. Essentially, these realtors created panic among white residents of an impending black 'invasion' into their neighbourhood, arguing that this invasion would undermine property values. The realtors sometimes went as far as to pay black women to walk down the street, employ black children to hand out leaflets advertising the real estate agent in the area, or lie to residents by intimating that black families had already bought homes in the neighbourhood. Agents would then purchase homes from locals at well below market costs and re-sell these houses to black families at above-market costs, making substantial profits in these racially transitional neighbourhoods.

Buffalo remains a city with an uncertain economic future. The Buffalo Fiscal Stability Authority officially intervened on July 3, 2003 declaring the city "...in a state of fiscal crisis, and...the welfare of the inhabitants of the city...seriously threatened" (Buffalo Fiscal Stability Authority Act, *Chapter 122 Laws of 2003*, S. 5695).

Despite its bleak economic prospects, however, Buffalonians maintain that their city is special. In 2001, *USA Today* named Buffalo the "City with a Heart" after hundreds of letters from locals displayed their proud heritage as a city of neighbours (Grossman 2001). For example, one resident wrote:

...I wake up on a snowy day and my neighbor has already cleared my driveway... You have to catch someone in the act just to thank them.

Echoing these sentiments, another resident opined:

...I love the coldest, snowiest days here because everyone grows closer. People come out of their houses, smiling and greeting one another on the street. It feels as safe as Mayberry and as beautiful and sentimental as a holiday greeting card.

## 2.6 CONCLUSIONS

The movement from an industrial to a post-industrial economy, the migration patterns of racial and ethnic groups, and technological advancements are large-scale changes that had effects nationally and even globally. But both these and more local changes affected *who* lived in neighbourhoods and *how* they were organized. The history of Buffalo from the mid-twentieth century onward is one of continuous decline in population size and socioeconomic prosperity. Demographic transitions have been particularly acute in this city over the post-WWII period. Similarly, transportation and housing decisions stimulated by urban renewal initiatives were felt unevenly across neighbourhoods.

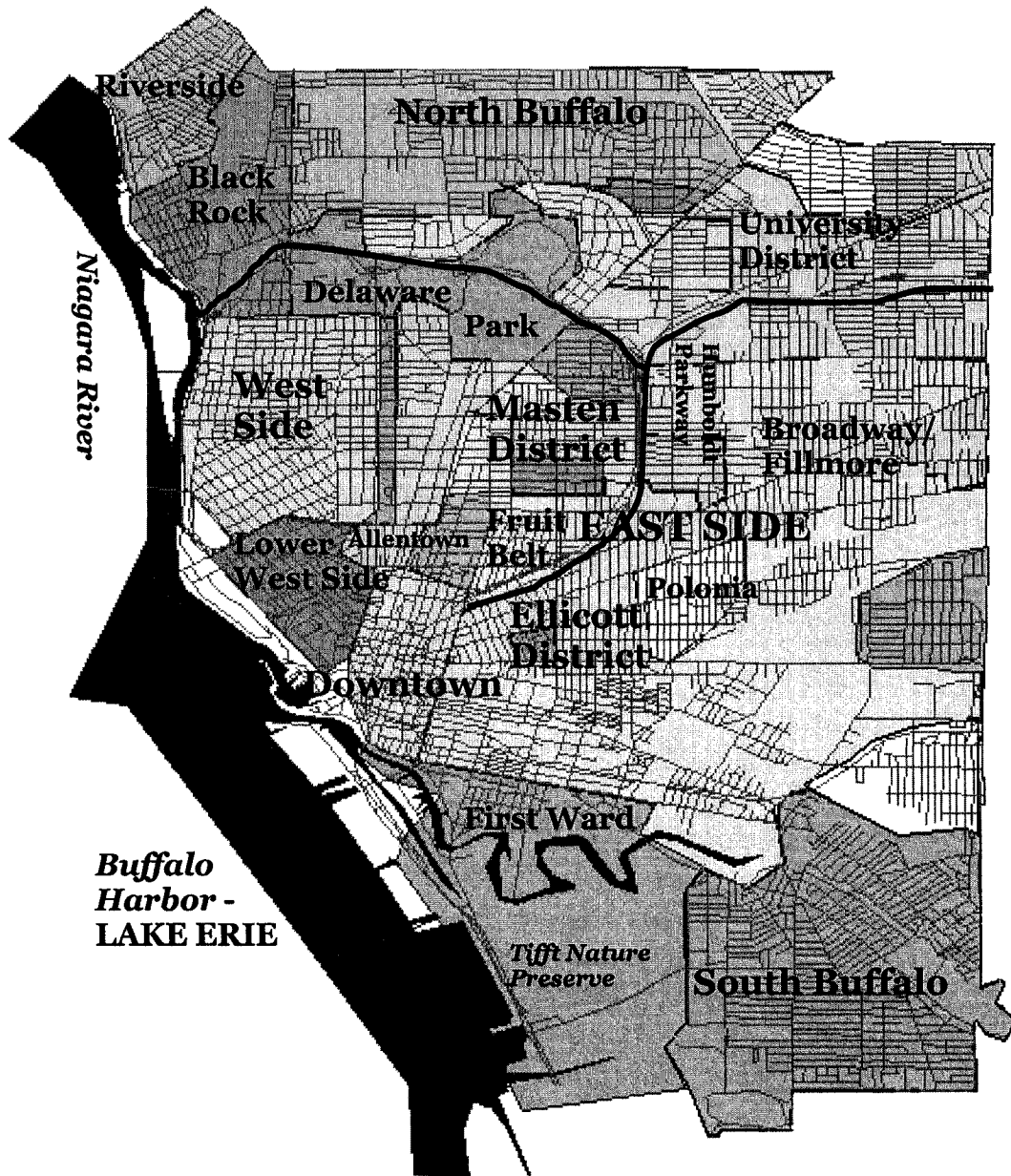
Despite sorting my review of the history of Buffalo in this chapter into three separate sections (socioeconomic changes, racial relations, and housing and urban renewal), the events described in each section were occurring simultaneously in the city, serving to reinforce and redirect the future of Buffalo's neighbourhoods. For example, in the midst of final planning about where Ellicott and Talbert Malls would be located, the Crystal Beach riot heightened tensions among residents, and ultimately solidified the notion that urban renewal efforts necessarily be focused in Buffalo's African American neighbourhoods (Wolcott 2006). The impact of heightened poverty, increased racial segregation, white flight to the suburbs, growing unemployment, and concentrated public housing have all been identified as urban problems that cause, or at least allow for, elevated levels of violence in affected neighbourhoods. The combination of these transitions in Buffalo is important for understanding neighbourhood-level changes in homicide that are the focus of the remainder of this dissertation.

Often, studies that have examined neighbourhood characteristics and their effects on crime and violence have been cross-sectional or, when they have been longitudinal, they encompass only one or two decades. LaFree (1999: 158) notes that much of the longitudinal research undertaken in sociology treats time as 'ahistorical', or, citing Isaac and Griffin (1989), "...treats time as a 'linear organizing device' marking incremental, equal units...undifferentiated and external to events and relationships." This chapter demonstrates that critical historical events at both the national level (i.e. the creation the Federal Housing Authority, the GI Bill, etc.) and more locally (i.e. transportation and public housing siting in Buffalo) occurred in Buffalo between 1950 and the end of the twentieth century. Knowledge of these transitions is important for contextualizing the

relationship between neighbourhood structural characteristics and the spatial distribution of homicide across five decades in Buffalo.



FIGURE 2.1



**Map of Buffalo Neighbourhoods\***

\*SUNY at Buffalo provides a list of 32 distinguishable districts (source: <http://ublib.buffalo.edu/libraries/units/sel/collections/maps/buffmap.html>) which were digitized and turned into shapefiles by Julian Gonzales, Christina Corsello, and Elyse Hunt-Heinzen in a 2003 Geographic Information Systems course under the direction of Professor George Tita at University of California, Irvine. I appreciate their hard work and their attention to detail in mapping these boundaries.

### **CHAPTER III. CITYWIDE TRENDS AND NEIGHBOURHOOD DEVIATIONS**

This chapter provides an overview of trends in demographic, socioeconomic, and housing-related characteristics in Buffalo between 1950 and 1990 and a preliminary investigation of the relationships between these characteristics within neighbourhoods. To supplement the historical description of Buffalo provided in the previous chapter, in the first section I offer quantitative evidence regarding the extent and nature of change over the period based on historical census data. The results indicate that, coupled with a dramatically declining total population, socio-demographic changes in the city included an increasing proportion of African American residents, an aging population, a reduction in the number and proportion of foreign born residents, declining male labour force participation, and a U-shaped trend in levels of poverty. Housing-related changes included falling home ownership rates and rising vacancy rates over the period under study. Based upon research on urban crime patterns in other cities, many of trends witnessed in Buffalo are expected to have reduced informal social controls in neighbourhoods and increased the social isolation of economically disadvantaged residents in the inner city (Kain 1968; Kasarada 1989; Massey & Denton 1993; Wilson 1987). Similar social transformations in other industrial “rustbelt” cities have been found to increase levels and concentrations of violence (Peterson and Krivo 1993; Sugrue 1996).

The second section of this chapter focuses on the associations between demographic, socioeconomic, and housing characteristics at the neighbourhood-level. In particular, I consider how these characteristics are differentially distributed across neighbourhoods in Buffalo. I also examine whether relationships between demographic,

socioeconomic, and housing-related characteristics are consistent over time. This preliminary descriptive analysis provides an important backdrop to the multivariate analyses undertaken in Chapters 5 and 6. Multivariate quantitative analyses using variables that are highly correlated can produce both biased and inefficient estimates. In this chapter, then, I introduce evidence concerning the extent to which exogenous variables co-vary with one another in Buffalo over time. An analysis of this sort determines whether multicollinearity problems will need to be addressed in later analyses.

The results illustrate fairly consistent trends in the bivariate relationships between demographic, socioeconomic, and housing variables. For instance, neighbourhoods experiencing higher poverty tend to be predominantly African American, they tend to be neighbourhoods with lower rates of male labour force participation, they have a greater volume of vacant properties, and they have lower rates of owner-occupied housing, but higher rates of black owner-occupied housing relative to neighbourhoods that are more economically advantaged. Moreover, associations between these neighbourhood characteristics hold for the entire postwar period. To some extent, then, the bivariate results presented in the second section of this chapter suggest stability in the types of features that characterize economically disadvantaged neighbourhoods over an extended historical period in Buffalo. This preliminary examination provides support for the position that the relationship between demographic, socioeconomic, and housing-related characteristics in Buffalo's neighbourhoods may be historically invariant, at least over the postwar period. However, there is some evidence provided in this section to suggest that associations between neighbourhood characteristics in the 1950s and 1960s differ in a

number of important ways from associations between neighbourhood characteristics in the 1970s through the end of the century. I describe these differences later in the chapter.

At the end of this chapter, I provide a description of homicide in Buffalo over the postwar period. This final section outlines how the level of homicide in the city as a whole, and within individual neighbourhoods, underwent dramatic change over the latter half of the twentieth century. I conclude with a discussion of bivariate associations between the key exogenous variables and neighbourhood homicide rates as a precursor to the more detailed analysis of these relationships that is the focus of Chapter 4.

### **3.1 DEFINING NEIGHBOURHOODS: AGGREGATION TO PRODUCE CITYWIDE EFFECTS**

The census data used in this chapter are collected by the United States Census Bureau. The Census Bureau collects tract-level information on a variety of social and demographic characteristics at each decennial census. Based on data compiled from the Elizabeth Mullen Bogue Files (Bogue, computer files) for both 1950 and 1960, and the Neighbourhood Change Data Base (NCDB) (GeoLytics Inc., 2003) for 1970 through 2000, I compiled data for Buffalo census tracts by decade on a variety of population characteristics (see Appendix 3.I for a description of data sources).

The NCDB normalizes tract boundaries to account for slight boundary change over the period, allowing for estimates that are more accurate at each census year. In the 1950s and 1960s the city of Buffalo was comprised of 72 census tracts; however from 1970 onward, the city was demarcated by 89 tracts. Thus, to create consistent tract boundaries over the 50 year period, it was necessary to merge tracts that had been divided

at the 1970 census. I then compared the merged tracts to earlier census maps through manual inspection and found that the resulting 72 tracts remained virtually stable throughout the period.<sup>19</sup> These 72 census tracts comprising Buffalo city proper encapsulate the geographic area examined in this dissertation, after data for the 34 tracts were merged to reflect earlier census divisions.<sup>20</sup> As it was necessary to aggregate the 34 tracts that had been subdivided at the 1970 census, all social and demographic data pertaining to those tracts are also aggregated in the remainder of this study.

### **3.2 DESCRIPTIVE STATISTICS: CITY-LEVEL TRENDS**

The tables and graphs presented in this section illustrate citywide trends in demographic, socioeconomic, and housing-related characteristics. Table 3.1 provides means, standard deviations, and ranges for each of the demographic, socioeconomic, and housing characteristics in Buffalo by decade. Because the citywide trends are derived from the mean of the 72 tracts, the range is able to identify the extent to which the most extreme tracts deviate from the citywide average.

#### **3.2.1 Trends in Demographic Characteristics**

The total population of Buffalo dropped 43.7 percent between 1950 and 1990 (from 580,132 to 326,747), and continued to decline more slowly throughout the 1990s

---

<sup>19</sup> Six tracts experienced slight changes in boundaries: tract 16 gained some of the area originally belonging to tract 23, tract 53 gained some of the area originally belonging to tract 64, and tract 71 gained some of the area originally belonging to tract 72. Appendix 3.II provides a map of these three boundary changes. Note that tract 71 and 72 are along the waterfront, tract 53 is Delaware Park, and tracts 16 and 23 include the Conrail yard at Central Avenue and Williams Street. These tracts, then, are less residential and so biases from boundary alterations should be minimal.

<sup>20</sup> A total of 34 tracts in 1970, 1980 and 1990 were aggregated into 17 to be consistent with the earlier 1950 and 1960 census boundaries. The following tracts were aggregated together: 1) 13.01 & 13.02, 2) 14.01 & 14.02, 3) 25.01 & 25.02, 4) 27.01 & 27.02, 5) 32.01 & 32.02, 6) 33.01 & 33.02, 7) 39.01 & 39.02, 8) 40.01 & 40.02, 9) 44.01 & 44.02, 10) 52.01 & 52.02, 11) 62.01 & 62.02, 12) 63.01 & 63.02, 13) 65.01 & 65.02, 14) 66.01 & 66.02, 15) 67.01 & 67.02, 16) 71.01 & 71.02, and 17) 72.01 & 72.02.

(see Figure 3.1) reaching 291,340 by the year 2000. This dramatic decline in the population of the city was accompanied by a growing suburban fringe in Erie County; in fact, by 1970 suburban residents outnumbered city residents for the first time (Kraus 2000; Taylor 1991). This resulted in both racial segregation and the social isolation of African Americans in Buffalo's inner city.

To illustrate, the proportion of the black population increased more than sevenfold, from less than four percent in 1950 to almost 30 percent by the 1990s in Buffalo (see Figure 3.2). However, this growth in the African American population was not accompanied by racial integration in Buffalo's neighbourhoods. Neighbourhood differences in the proportion of African American residents provide compelling evidence of extensive segregation in Buffalo, which according to Massey and Denton (1993) is one of 16 hyper-segregated cities in the United States. That is, a cursory examination of the range of percent black in each decade (see Table 3.1) shows that while African Americans comprised almost all of the residents in some neighbourhoods, they were completely absent in other neighbourhoods.

Buffalo's minority population from the immediate postwar years to the present was comprised almost exclusively of African Americans, with some minor in-migration of Puerto Ricans beginning in the 1970s.<sup>21</sup> But even while the Latino population grew over the last few decades of the twentieth century, Figure 3.3 indicates that their share of the minority population in Buffalo remained extremely low through the end of the study period (reaching only 4.1 percent by 1990). There is evidence, however, that Latino

---

<sup>21</sup> While detailed distinctions between minority racial groups were not available in the 1950 and 1960 census data for Buffalo, the "non-white" population was overwhelmingly African American at mid-century; 97.2 percent (1950) and 96.6 percent (1960) of all non-white residents in Buffalo were African American.

residents lived in relatively integrated neighbourhoods. Table 3.1 shows that the range of percentage Latino population across neighbourhoods in Buffalo varied from zero to 43 percent in 1990. Even then, none of the neighbourhoods in Buffalo could be characterized as majority Latino.

Buffalo also experienced an aging of the population over the period under study. Figure 3.4 illustrates that the proportion of young residents in the city declined from a high of 33.6 percent in 1960 to a low of 23.9 percent in 1990.<sup>22</sup> Again, however, there is evidence of substantial variation across neighbourhoods in the age structure of the population. For example, by the end of the period, the proportion of the population under 18 years of age ranged from 3.3 percent to 36 percent across neighbourhoods.

Foreign born residents are indicative of immigration flows into an area, and the trends in Buffalo illustrate a large influx of foreign born residents between 1950 and 1960; after 1960 the proportion of foreign born residents declined steeply (see Figure 3.5). The absolute number of foreign born residents increased two and a half times between 1950 and 1960 (from approximately 70,000 to 188,000) before dropping off markedly by 1970 (to 35,000), and continuing a downward trend through 1980 (to 22,000) and 1990 (to 15,000). Between 1950 and 1960 there was a significant drop in the native born population (from 510,000 to 344,000) which rose again to 425,000 by 1970 and then declined in 1980 to 334,000 and again in 1990 to 312,000. This suggests that trends in the foreign born population in Buffalo were not predominantly driven by

---

<sup>22</sup> Note that the 1950 and 1960 figures for percentage of young residents in the population include all persons younger than 20 years of age, while the 1970 through 1990 figures limit the age range to less than 18 years. While this difference in operationalization of the 'young' population introduces some measurement error, the error should be minimal (see Table 3.1).

fluctuations in the numbers of native born residents, but rather by changes in the number of foreign born residents immigrating to, and migrating from Buffalo.

The early influx of foreign born residents was likely driven by the booming wartime economy, which had given Buffalo a national reputation as a thriving industrial mecca in the immediate postwar period. But the percentage of foreign born residents quickly fell and the trend after 1960 was at odds with trends in national immigration flows. That is, while the national percent foreign born increased between 1970 and 2000 (more than doubling from approximately five percent to more than 10 percent; Batchelor 2004), the proportion of foreign born residents in Buffalo continued to drop over this period, both in relative and absolute terms. This, coupled with the aging of Buffalo's population, provides a picture of a city experiencing extreme out-migration after the 1960s with little attraction for potential in-migrants.

The data illustrate that certain neighbourhoods in Buffalo were destination centres for new immigrants. At the height of the foreign born boom, in 1960, neighbourhoods ranged from three percent foreign born to 57 percent. This pattern, while attenuated by the 1990s, continued such that some neighbourhoods in Buffalo had no foreign born residents while other neighbourhoods had up to 12 percent of their residents originating from outside of the U.S. The pattern in Buffalo is consistent with literature on the destination neighbourhoods of immigrants from the early 1920s. Research demonstrates that foreign born residents tend to re-locate to particular neighbourhoods in cities, out of either preference for neighbourhoods comprised of similar others, or due to the necessity of relocating to neighbourhoods with lower housing prices (Shaw and McKay 1942; Park, Burgess and McKenzie 1925; Taylor 1991).



Overall, the demographic changes in Buffalo over the period are generally consistent with those experienced across the “rustbelt” region of the United States. A rapid depopulation of once economically thriving urban centres underscored larger social and economic trends accompanying the transition from an industrial to a post-industrial economy. With the decentralization of industry and the movement toward a service-based economy, the proportion of workers employed in industrial manufacturing rapidly declined in Buffalo, as elsewhere (see Appendix 3.III). Those manufacturing industries that did not close were either downsized or relocated out of urban centres into the suburbs and/or other rapidly growing capital markets in the southern and western regions of the country (Goldman 1990; Sugrue 1996). As a result, industrial cities witnessed a large-scale abandonment by those financially able to vacate, either to be nearer to places of employment or to escape racial integration of neighbourhoods and schools, and Buffalo was no different.<sup>23</sup> Residents left behind in the inner city urban core formed what would later be described as the ‘urban underclass’ or the ‘ghetto poor’ in neighbourhoods characterized by “...growing concentrations of low income minorities...[who] are isolated from the mainstream social, occupational, and political institutions in society” (Peterson 1991:16).

### **3.2.2 Trends in Socioeconomic Characteristics**

Trends in education and labour force participation illustrate the prospects for socio-economic mobility of Buffalonians in the post-WWII period. Persons 25 years and older who attained a high school diploma comprised just under one third of the

---

<sup>23</sup> Buffalo, like many other American cities, has a tumultuous history of race relations. Realtor blockbusting, in the form of convincing whites to leave a neighbourhood for fear that African Americans were ready to move in was a common practice during the 1970s. So too were frustrations over bussing and school desegregation, all of which caused great financial and social strains on the black population of Buffalo (Goldman 1990; Kraus 2000).

population in 1950 (29.6 percent) but rose to about two thirds of the population by 1990 (65.0 percent) (see Figure 3.6). Despite the more than two-fold increase, however, the percentage of residents in Buffalo who had graduated from high school was still well below the 1990 national level of 77.6 percent (U.S. Census Bureau, 2003: Table A-2). Table 3.1 illustrates, however, that educational attainment varied substantially across neighbourhoods. Even as late as 1990, the percentage of residents 25 and older who had graduated from high school ranged from less than one quarter to 86.8 percent across Buffalo's 72 census tracts.

With respect to employment, male labour force participation declined while female labour force participation rose over the period, as illustrated in Figure 3.7. This trend is consistent with that found in most U.S. cities, whether they are located in the north-east or in other regions of the country (U.S. Bureau of the Census 2000). Buffalo remained, however, below the national levels of both male and female labour force participation at all census years, even though the trends mirror those for the nation as a whole. By 1990, the male labour force participation rate in Buffalo reached an all time low of 64.9 percent, more than 12 percentage points below the national level (77.6 percent) and a full 15 percent below its own male labour force participation rate in 1950 (80.1 percent, Table 3.1).<sup>24</sup> The 1950 rate of labour force participation likely reflects the

---

<sup>24</sup> Note that the denominator for the 1950 and 1960 labour force participation figures include persons 14 years and older. By contrast, the figures for 1970 through 1990 are based on a population denominator of persons 16 years and older. Due to changing labour laws relating to the minimum age of employment, such as the Fair Labor Standards Act of 1938, the legality of employing children as an inexpensive and controllable workforce was increasingly challenged by reformers from the beginning of the twentieth century. Indeed, the Fair Labor Standards Act (1938) arising during the Great Depression required that eligible employees be at least 16 years of age in both the mining and manufacturing industries (Trattner 1970) – the latter of which was one of the largest industries in Buffalo. While males as young as 14 were still employed as telegraph messengers, for example, into the 1950s, the reliance on child labour was rapidly declining (Downey 2003). Thus, while the census data for the 1950s and 1960s included some employed persons between the ages of 14 and 16 in the labour force participation rates, the proportion of

role that Buffalo played in war-time industries that would not have geared down in the years immediately following WWII. Only one decade later, however, the average male labour force participation in the city had declined measurably to 69.7 percent.

Particularly noteworthy are the differences in male labour force participation across Buffalo's neighbourhoods. For example, in 1950 the male labour force participation rate ranged from a low of 23.9 percent to a high of 86.7 percent in Buffalo's 72 tracts. This indicates that the variation in male labour force participation at any given decade across neighbourhoods in Buffalo was much greater than were the changes for the city as a whole over time. Substantial tract-level variation characterizes the entire period of study. Neighbourhoods in Buffalo also show variability in the proportion of females participating in the labour force throughout the period. In 1990, for instance, some neighbourhoods were characterized by as few as 15 percent of females participating in the labour force while others had up to 68 percent.

Buffalo experienced sizeable changes in the proportion of the population living below the poverty line. Inexorably linked to conceptions of the 'underclass' (Jencks & Peterson 1991; Peterson 1991; Wilson 1987), relative deprivation and strain (Blau and Blau 1982; Agnew 1999; Merton 1938), and a distinctive subculture stressing short-term goals (Anderson 1999; Miller 1958; Peterson 1991), poverty places individuals in a position of absolute disadvantage, and potential relative disadvantage. Moreover, the negative effects of economic deprivation can be compounded if large numbers of neighbourhood residents live below the poverty line (Anderson 1999; Jargowsky 1997;

---

persons in this age range employed during the immediate postwar period is certainly much smaller than the proportion of persons employed in most other age categories. Thus, despite the very high levels of labour force participation in Buffalo during the 1950s and 1960s, the discrepancy between the denominators used in 1950 and 1960 compared to 1970 through 1990 are likely to produce conservative estimates of the proportion of employed persons in Buffalo in 1950 and 1960.

Wilson 1987). A brief history of how poverty has been variously defined, and an explanation of the procedure for operationalizing poverty in this analysis is presented in Appendix 3.IV.

Table 3.2 provides descriptive data on levels of poverty in Buffalo for each of the five decades following WWII. According to Murray<sup>25</sup> (1984), approximately 30 percent of the national population was living “in poverty” in 1950. This is consistent with the findings for Buffalo using the poverty measure I derived based on consumer price index spending power (refer to Appendix 3.IV). In 1950, according to this measure, 31.2 percent of the city’s population would be defined as poor. After a substantial fall between 1950 and 1960, and a more muted decline through 1970, the proportion of the population living in poverty surged upward during the latter half of the period to create a U-shaped trend in Buffalo (see Figure 3.8).

There is extensive variation in the percentage of residents living below the poverty line at the tract-level in each of the decades under examination (see Table 3.2). In addition, the range in percentage living below the poverty line increased over time in Buffalo’s census tracts. For example, in 1950 almost two-thirds (65.5 percent) of residents in Buffalo’s poorest tract lived below the poverty line; whereas 15.6 percent of the population lived below the poverty line in Buffalo’s most affluent tract. By 1990, the proportion living in poverty in the poorest tract had changed very little (to approximately 63 percent); however, in the most affluent neighbourhood only 5.4 percent of residents lived in poverty. In other words, the gap between the most and least deprived neighbourhoods increased over time; however at each decade there were at least some neighbourhoods experiencing extreme concentrations of poverty in Buffalo. Between

---

<sup>25</sup> Murray (1984) does not provide a formula for his calculation of the percentage in poverty in 1950.

1950 and 1990, the most poverty-stricken neighbourhoods were characterised by more than half of residents living below the poverty line.<sup>26</sup>

In all, socioeconomic changes in Buffalo generally typify industrial cities in the postwar period such that educational attainment and labour force figures moved in the same direction as the national trends. Nonetheless, rates of both educational attainment and labour force participation were consistently lower in Buffalo compared to national rates at each decade. These trends are important as both educational attainment and employment serve as protective factors against crime at an individual level (Currie 1996), but also at an aggregate level (Pyle 1998). Moreover, trends in city-level poverty rates in Buffalo, particularly since 1970, demonstrate the worsening economic prospects of residents in the latter decades of the twentieth century.

### **3.2.3 Trends in Housing Characteristics**

The remainder of the discussion of trends in Buffalo focuses on housing-related characteristics between 1950 and 1990. The citywide trajectory is one of declining home ownership from an average of 46.2 percent in 1950 to 40.7 percent in 1990 (see Figure 3.9). The range in this percentage in any given census year provides compelling evidence of distinctive neighbourhood-level patterns within an overall pattern of citywide decline. For example, in 1990 less than three percent of residents owned their homes in the

---

<sup>26</sup> Jargowsky (1997) provides evidence of an increasing concentration of poverty (defined as more than 40 percent of residents live in poverty) within census tracts in Buffalo and elsewhere, however his analysis is restricted to the 1970 through 1990 period. Indeed, the data in Table 3.2 shows that the highest poverty neighbourhoods in Buffalo experienced an increasing proportion of residents living below the poverty line since the 1970s. However, by extending the time frame back to 1950 in Buffalo, a different pattern emerges. In addition to this within-neighbourhood poverty concentration, I find a similar U-shaped pattern of contracting and then expanding numbers of high poverty tracts in Buffalo. This confirms the consistently increasing trend described by Jargowsky (1997) between 1970 and 1990 but shows more variability over a larger time frame. For instance, the number of extreme poverty neighbourhoods declined from 14 out of 72 in 1950 (19.4 percent) to 3 in 1960 (4.2 percent), down further to 1 in 1970 (1.4 percent), then increased to 5 in 1980 (6.9 percent), and finally reached 15 by 1990 (20.8 percent).

neighbourhood with the lowest owner-occupied housing, compared to almost 70 percent of residents in the neighbourhood with the highest home ownership.

In terms of owner-occupied housing, however, countervailing trends highlight the distinct pathways in home ownership taken by racial groups in Buffalo. As Figure 3.10 illustrates, the *trend* for black<sup>27</sup> owner-occupied housing is the mirror opposite of the overall trend in owner-occupied housing between 1950 and 1990. However the *levels* of owner-occupied housing among African Americans are at all time periods extremely low compared to whites.<sup>28</sup> The average percentage of black owner-occupied housing almost doubled in every census year from 1950 through 1980 and continued to rise, although less dramatically, until 1990. By 1990, black homeowners comprised 7.9 percent of the population in Buffalo, but across neighbourhoods this ranged from no black homeowners to 49.9 percent.

The trend for percentage of vacant housing in Buffalo as a whole is shown in Figure 3.11. In 1950 only about 1 percent of homes were vacant in the city and the neighbourhood with the largest proportion of vacant properties, while three times the citywide average, still contained very few vacant housing units (3.5 percent). Similar to the black owner-occupied housing figures, the percentage of vacant properties for the city as a whole increased two fold every decade from 1950 to 1980, and then experienced a much slower increase thereafter, reaching 10.1 percent in 1990. Similar to some of the social and demographic characteristics described earlier, the percent of vacant housing

---

<sup>27</sup> Again, the 1950 and 1960 data do not permit a distinction between black and other minority racial groups. The figures for 1950 and 1960, then, include all non-white owner-occupied housing in this category. Recall that the non-white population was overwhelmingly a black population at mid-century wherein 97.2 percent (1950) and 96.6 percent (1960) of all non-white residents in Buffalo were African American.

<sup>28</sup> Note that the y and z axes on Figure 3.10 have very different ranges.

units in the city masks important variation across neighbourhoods. In 1990, for instance, the percentage of vacant housing ranged from a low of three percent to a high of almost 46 percent in Buffalo's 72 census tracts.

While the percent of residents living in the same house for the previous five years<sup>29</sup> (or the percent residentially stable) for the city as a whole remained fairly steady at between 50 and 60 percent over the post WWII period, the value ranges widely across neighbourhoods. For example, in 1990 this ranged from a low of 22.8 percent to a high of 77.9 percent (see Figure 3.12). This suggests that the amount of residential turnover varied widely by neighbourhood at the same time as the citywide average remained fairly constant between 1960 and 1990. Across all neighbourhoods in Buffalo, then, just over half of the population resided in the same house as they had five years previously in each decade.

Overall, Buffalo's housing trends paint a picture of a city that is consistent with the deteriorating socioeconomic conditions described in the previous section. For example, fewer residents, both proportionately and numerically, owned their own homes in the postwar era. Researchers have long considered the role that homeowners play in neighbourhood safety and prosperity to be very important; the assumption is that homeowners tend to be more invested both personally and financially in the well-being of their neighbourhood compared to renters (Ahlbrandt & Brophy 1975; Husock 1991; Owens 1997). The increasing home ownership rates among African American residents counters the downward trend experienced among all householders in Buffalo. Despite

---

<sup>29</sup> The residential stability measure for 1950 is not comparable to the remaining measures for the 1960s through 1990s because the 1950 measure asks only if the respondent lived in the same house *one* year prior. This 1950 measure, then, does not capture the concept of stability in the residential population (or its opposite, high turnover) effectively. As such, I limit the discussion of trends in residential stability to the period between 1960 and 1990.

this positive trend, African American residents in Buffalo were much less likely to own their own homes relative to their white counterparts over this period; and when African Americans did own their own homes, they were clustered in racially segregated neighbourhoods.

There was also a dramatic rise in vacant housing that unevenly affected neighbourhoods across Buffalo, with some neighbourhoods suffering from widespread vacancies in nearly half of all available housing units by the end of the century. Similarly, trends in residential stability show that turnover in the population remained fairly constant even among those who remained in the city of Buffalo proper. These housing-related trends over the postwar period demonstrate considerable abandonment, consistent with the general decline in socioeconomic indicators described in the previous section.

### **3.3 BIVARIATE ASSOCIATIONS AMONG DEMOGRAPHIC, SOCIOECONOMIC, AND HOUSING VARIABLES IN NEIGHBOURHOODS**

The previous section highlighted how trends in demographic, socioeconomic, and housing characteristics in Buffalo were consistently in the direction expected to increase neighbourhood homicide rates as described in Chapter 1. Moreover, the tract-level variations in these variables (provided in Table 3.1) suggest a marked departure from the citywide average for at least some neighbourhoods in any given census year. The next step is to determine how these demographic, socioeconomic, and housing characteristics are related to one another within neighbourhoods. Research on “neighbourhood effects” has consistently demonstrated that particular characteristics tend to be highly correlated



with one another. In this section, I assess the degree to which these characteristics tend to cluster together in Buffalo's neighbourhoods. Further, in contrast to most neighbourhood-level research (which has typically relied on cross-sectional data or data for short time spans), I examine whether characteristics that are correlated in one decade in neighbourhoods are similarly correlated at four other decades.

Table 3.3 provides a tract-level zero-order correlation matrix of each of the demographic, socioeconomic, and housing characteristics discussed above, by decade. This is a summary table describing 365 different bivariate correlations between 11 neighbourhood characteristics in each of the five census decades.<sup>30</sup> For each bivariate comparison in the table, the significance and direction of five zero-order correlations are provided, one for each of the five decades from 1950 through 1990. This summary table of the direction and significance of correlations allows for comparisons of each of the cross-sectional zero-order correlations for five decades. Thus, I can determine the extent to which the bivariate relationships remain the same among demographic, socioeconomic, and housing characteristics across the entire period of study.

As elaborated below, the relationships in Table 3.3 are generally in the expected directions, and provide preliminary evidence of the clustering of particular combinations of characteristics in Buffalo's neighbourhoods. To facilitate a discussion of how neighbourhood characteristics co-vary, I describe the bivariate results for three referents: 1) percent black, 2) percent foreign born and 3) percent in poverty. These three referents are selected because of their significance in both the recent history of Buffalo as well as their theoretical importance. The following section provides a general description of the

---

<sup>30</sup> The zero-order correlation coefficients between residential stability in 1950 and each of the other 10 variables are not included (see fn. 11). These ten correlations are excluded from Table 3.3 and are identified by an 'X' in the table.

demographic, socioeconomic, and housing characteristics that coalesce with these three variables across Buffalo neighbourhoods between 1950 and 1990.

Wilson's (1987) social transformation theory, which describes the transformation of inner city neighbourhoods in industrial cities into impoverished black urban ghettos, highlights the importance of racial composition as a distinguishing characteristic of neighbourhoods. Moreover, the extreme residential segregation in Buffalo raises the question of whether neighbourhoods with larger proportions of African American residents may exhibit distinctive features relative to other neighbourhoods.

According to the bivariate correlations in Table 3.3, in Buffalo neighbourhoods with larger proportions of African Americans, there were lower proportions of foreign born residents, lower proportions of residents who had attained a high school diploma by the age of 25, higher proportions of residents living below the poverty line, and lower proportions of total owner-occupied housing but higher proportions of black owner-occupied housing in every decade from 1950 to 1990. Those neighbourhoods that were home to relatively larger African American populations were also characterised by a higher percentage of young residents, a lower male labour force participation rate, and higher vacancy rates from 1960 through 1990. Neither the female labour force participation rate nor the level of residential stability was consistently associated with the proportion of African Americans living in neighbourhoods, particularly in the later decades of the twentieth century. These bivariate findings are consistent with the characteristics that typify minority poverty-stricken ghettos described by both Jargowsky (1997) and Wilson (1987), both of whom studied the period between 1970 and 1990.

Thus, I show that these associations characterized Buffalo's neighbourhoods in the years prior to those studied by Jargowsky (1997) and Wilson (1987) as well.

In terms of foreign born residents, Buffalo is a city that is characterized by strong and distinctive ethnic enclaves which formed the basis of neighbourhood settlements (Goldman 1983). Immigrants early in the twentieth century were attracted to areas in Buffalo already inhabited by others who shared the same social and cultural background, language preference, and dietary preferences, as served by ethnic restaurants and grocery stores. As illustrated in Table 3.3, the neighbourhood characteristics associated with a large foreign born population differ from the characteristics that cluster together with larger African American populations.

Tracts with higher levels of foreign born residents had lower proportions of young residents and lower rates of poverty in 1960 through 1990, greater proportions of adults who had graduated from high school between 1970 and 1990, less black owner-occupied housing in all decades, and fewer vacant properties from the 1960s through the 1990s. In addition, tracts with higher proportions of foreign born residents also tended to have higher rates of male labour force participation in 1960, 1980, and 1990, and higher female labour force participation in 1960 and 1990. Both the proportion of owner-occupied housing and residential stability were not associated with larger foreign born populations in neighbourhoods in any consistent manner over the postwar period.

Finally, poverty has been shown to be an important correlate of a variety of social problems at the neighbourhood-level (Brooks-Gunn, Duncan, and Aber 1997a; Jargowsky 1997). Across the entire period of this study, neighbourhoods with high rates of poverty also tended to have high proportions of African American residents, lower

male labour force participation rates, a greater proportion of vacant properties, and fewer owner-occupied housing units but higher rates of black owner-occupied housing compared to neighbourhoods with less poverty (see Table 3.3). High poverty neighbourhoods also tended to be neighbourhoods with smaller proportions of young residents in the 1950s but proportionately more young persons than in wealthier neighbourhoods from the 1960s through the 1990s. Fewer foreign born residents and fewer residents attaining a high school diploma lived in poorer neighbourhoods from 1960 through 1990, and neighbourhoods with higher levels of poverty were places that experienced less residential stability in the last four decades of the twentieth century. Finally, greater female labour force participation was associated with higher poverty neighbourhoods in the 1950s, but the direction of the relationship reversed and remained negative through the remainder of the period.

This short section illustrated the degree to which particular neighbourhood characteristics clustered together over the entire postwar period. There is some evidence that bivariate relationships between each of the demographic, socioeconomic, and housing-related variables exhibit similar associations with one another from the 1950s through the 1990s. For example, neighbourhoods with higher poverty rates at any decade were also more likely to house African American populations, to exhibit lower labour force participation, and to evidence lower levels of home ownership and higher rates of vacancy. The consistency in these bivariate associations over time suggests a general stability in the clustering of characteristics in Buffalo's poverty-stricken neighbourhoods. At the same time, these preliminary analyses also provide evidence of more varied

relationships between exogenous variables particularly in the 1950s and 1960s.<sup>31</sup> These differences in associations between neighbourhood characteristics are examined more fully in Chapter 5. However, the current analysis provides at least some suggestion that a study of neighbourhood effects over an extended time period may point to an historical contingency in the neighbourhood characteristics that cluster together. Such a contingency would require more nuanced theorizing about the relationship between neighbourhood characteristics and homicide than that found in studies covering recent decades alone.

### **3.4 AN OVERVIEW OF TRENDS IN HOMICIDE POST WWII**

I begin this section by describing homicide trends both for the city of Buffalo as a whole and for individual neighbourhoods over the post WWII period. This descriptive analysis illustrates that the homicide rate in Buffalo followed similar trends in homicide for the rest of the country. During the 1950s, as in the decades before, the homicide rate tended to be relatively low and stable in both Buffalo and elsewhere in the U.S. But beginning in the mid-1960s homicide rates rose rapidly and remained high from the 1970s through the early 1990s (with a slight drop in the 1980s). After peaking in the early 1990s, homicide rates across the country returned to levels comparable to the 1970s (Blumstein 2000). This pattern of growth and decline in homicide rates is consistent across cities, counties, and states in the U.S.

---

<sup>31</sup> For instance, the relationship between vacant housing units and eight of the ten other key variables differs in either 1950, 1960, or both compared to the 1970 through 1990 periods (see Table 3.3). Similarly, the relationship between the proportion of foreign born and eight of the ten other variables differs in the early decades of the period under study. These are only two examples of a larger trend illustrating differences in zero-order relationships among key exogenous variables during the 1950s and 1960s compared to later in the period.

In this section, I also determine the extent to which neighbourhoods with different types of characteristics exhibit different levels of homicide, and moreover whether the types of neighbourhoods experiencing homicide change over time. That is, I examine the bivariate correlations between both neighbourhood homicide rates (and counts) and each of the demographic, socioeconomic, and housing characteristics discussed in the previous section. Not surprisingly, the results of this descriptive analysis indicate that homicide tends to be clustered in particular kinds of neighbourhoods in Buffalo. African American neighbourhoods, neighbourhoods that house native born populations, higher poverty neighbourhoods, neighbourhoods with proportionately fewer residents finishing high school, and neighbourhoods with lower rates of owner-occupied housing typically experienced the most homicide. However, extending the analysis back to the 1950s illustrates that the relationships between homicide and demographic, socioeconomic, and housing-related variables at the tract level are not entirely consistent across the postwar period. These bivariate analyses further suggest that associations between the exogenous variables that are commonly associated with neighbourhood homicide rates may be historically contingent. I elaborate on these findings below.

### **3.4.1 Citywide Homicide Trends in Buffalo**

Homicide trends for the city of Buffalo indicate that, until 1965, the homicide rate was relatively low and stable, averaging 3.3 homicides per 100,000 residents between 1950 and 1965 (see Figure 3.13). By 1971, the homicide rate had jumped to 16.6 per 100,000 and by 1980 to 17.6 before dropping in the late 1980s. In 1994, the homicide rate peaked at 27.8 per 100,000 persons, before declining substantially to 10.4 by 1999. This overall trend for Buffalo obscures different patterns at the neighbourhood-level.

This is perhaps not surprising given the earlier findings which showed substantial neighbourhood-level variation in the factors that have been associated with homicide in other research.

A number of mechanisms have been proposed to account for the link between demographic, socioeconomic, and housing-related characteristics and homicide, each derived from distinctive but related explanations, including social disorganization (Shaw and McKay 1942), constraints on collective efficacy (Sampson, Raudenbush, and Earls 1997), concentration effects (Wilson 1987), and subcultural adaptations (Anderson 1999). Each of these perspectives leads to the expectation that neighbourhoods within cities will vary in their levels and trends of homicide. That is, neighbourhoods that are economically disadvantaged, isolated, and lack formal and informal controls should experience elevated homicide; whereas neighbourhoods that do not suffer from economic and social problems should demonstrate markedly different levels and trends in homicide.

### **3.4.2 Homicide in Buffalo Neighbourhoods**

This introductory examination of homicide across neighbourhoods in Buffalo, and over time, provides a backdrop to the more intensive discussion that is the subject of the next chapter. Table 3.4 illustrates the number and rate of homicides occurring over five decades in Buffalo neighbourhoods including the average number of homicides per tract, the average homicide rate per tract, and various descriptive characteristics that capture neighbourhood differences in homicide.

In terms of homicide counts, the average number of incidents occurring in Buffalo's neighbourhoods increased steadily between the 1950s (2.18 homicides) and the 1960s (3.44 homicides) and more dramatically by the 1970s (to 8.11 homicides) (see

Table 3.4). On average, tracts experienced fewer homicide incidents in the 1980s (5.51 homicides), but by the 1990s the average had increased again to 7.90 homicide victims per tract. The standard deviations of these averages indicate a considerably skewed distribution of homicide counts in each of these five decades. In every decade, there were many tracts that did not experience any homicide and some that exhibited many homicides. Despite the fact that the total number of homicides per decade increased dramatically between 1950 and 1970, however, the homicide count in the neighbourhood experiencing the highest number of homicides in each decade changed very little. For example, in the 1950s, the tract with the most homicides had 46 incidents, while in 1970 the number of homicides in the most violent tract was only marginally greater, at 50 homicides.<sup>32</sup>

However, because the population of Buffalo declined by almost half between 1950 and the end of the century, I standardized homicide counts and created neighbourhood homicide rates. This allows for comparisons that control for differences in population *between* neighbourhoods and changes in populations *within* neighbourhoods over time. The homicide rate, then, is a measure of the number of homicides per tract in each decade divided by the tract population at mid-decade – ostensibly, the “population at risk.”<sup>33</sup> Like the count averages, the average homicide

---

<sup>32</sup> The neighbourhood with the greatest number of homicides during the 1950s (tract 14) was the same neighbourhood with the greatest number of homicides during the 1970s. During the 1950s, 1960s, and 1970s, tract 14 experienced more homicides than any other neighbourhood in the city in each decade. By contrast, during the 1980s and 1990s, tract 27 exhibited the largest number of homicides.

<sup>33</sup> There is debate in the literature about the extent to which the residential population is the appropriate measure of the “population at risk” given that it does not adequately capture flows of non-residents into and out of tracts on a daily basis, or what might be thought of as ‘opportunities’ for homicide. For example, in the central business district where the residential population tends to be lower, people filter into the area for work and leisure on a regular basis (Boggs 1965; Wikström 1995; Wilcox, Land, and Hunt 2003). The use of counts versus rates is an important consideration in this study as there have been dramatic changes in both the population of residential and commercial areas of Buffalo, and in the areas experiencing the most



rates by decade for neighbourhoods in Buffalo increased rather dramatically between the 1950s and 1960s (displaying an almost two-fold increase) and again between the 1960s and 1970s (displaying almost a three-fold increase). After dropping during the 1980s, the mean homicide rate averaged across all neighbourhoods in Buffalo was 1.74 per 1,000 during the 1990s. Thus, despite changes in Buffalo's population over time, similar trends in homicide are observed whether counts or rates are used.

Figure 3.14 provides a graph of a few select neighbourhoods in Buffalo that exhibited some of the highest homicide rates over the period. For example, tract 14, which is part of the central business district, exhibited the highest homicide rates per 1,000 in the city in both the 1950s and 1960s. In the 1970s, tract 72, which is along the waterfront and near to the central business district, had the highest homicide rate, but by the 1980s tract 26, in the Ellicott district, was home to the highest homicide rate in the city. By the 1990s, tract 35, which is located further north and east of Ellicott into the Masten/East Delevan district, claimed the highest homicide rate. From Figure 3.14 it is clear that trends in homicide differed substantially over time even across the neighbourhoods with elevated homicide rates. These changes in the most violent neighbourhoods of the city are suggestive of a general movement of homicide north and east of the downtown core over time. A more detailed analysis of spatial and temporal trends in homicide will be the focus of Chapter 4.

---

homicide over the postwar period (Griffiths 2004). Moreover, the dramatic loss of population in certain census tracts results in very different homicide rates depending on the denominator employed. For example, tract 16 had a population of 8,703 in 1970 declining to 3,969 by 1980. There were 48 total homicides in tract 16 between January 1<sup>st</sup> 1970 and December 31<sup>st</sup> 1979. If the decennial homicide rate were calculated based on the 1970 tract population, the rate would be 5.52 per 1,000 over the decade. If the homicide rate were calculated with the 1980 tract population, the rate would be 12.09 per 1,000. Thus, to ensure that the denominator of the homicide rate calculation was as close to the true population over each decade, I calculated a linear extrapolation of the total tract population and used the mid-decade estimate as the denominator. In the case of tract 16, for example, the mid-decade population is estimated at 6,336 and the homicide rate is calculated as 7.58 per 1,000.

The descriptive statistics presented here provide basic background information on the distribution of homicide across neighbourhoods in Buffalo. Not surprisingly, the results indicate that both homicide incidents and homicide rates were not uniformly spread across Buffalo's neighbourhoods. Rather there was substantial variation across neighbourhoods in levels of homicide for each decade under study.

### **3.4.3 Bivariate Associations between Demographic, Socioeconomic, and Housing Characteristics with Homicide**

In this section, I discuss how neighbourhood characteristics are related to local homicide levels. Theoretical perspectives attempting to explain neighbourhood-level violence have primarily focused on the role of socioeconomic disadvantage as a cause of crime (Anderson 1999; Blau and Blau 1982; Bourgois 2003; Shaw and McKay 1942; Sullivan 1989). Perhaps the most salient neighbourhood-level perspective in the literature on neighbourhoods and crime is social disorganization theory and its various derivatives. Recall that this perspective argues that neighbourhood-level economic disadvantage, ethnic/racial heterogeneity, and residential instability foster high levels of crime. The postulated mechanisms explaining the link between the structural characteristics of neighbourhoods and crime is a lack of social organization, which is typically defined as the inability of a neighbourhood to regulate and organize itself to achieve common goals (Sampson and Groves 1989). The formation of neighbour networks that would otherwise be relied upon to promote social control and guardianship of persons and property is inhibited in disorganized areas. Consequences of this social disorganization include an unwillingness to intervene in problems occurring in the area, as well as visible signs of decay (e.g., litter, boarded up buildings) that provide venues for

street crime and serve as signs of reduced neighbourhood engagement and control efforts by locals. The process then becomes a self-fulfilling one whereby social disorganization engenders more social disorganization stimulating a spiral of decline (Skogan 1990).

Table 3.5 presents bivariate correlations between homicide (measured as counts in Table 3.5a and rates in Table 3.5b) and demographic, socioeconomic, and housing variables for Buffalo neighbourhoods between the 1950s and the 1990s. The relationships identified here provide another example of homicide clustering in particular types of neighbourhoods within cities, specifically neighbourhoods that exhibit the structural disadvantages associated with social disorganization. There are generally high and consistent correlations between homicides (whether measured as counts or rates) and most of the exogenous variables in the directions expected. Without exception, neighbourhoods with the following characteristics experienced the highest numbers and rates of homicide during each respective decade: a higher percentage of African American residents, a lower percentage of foreign born residents, a lower percentage of adults with a high school diploma, a higher percentage of residents in poverty, a lower percentage of owner-occupied housing, and a higher percentage of black owner-occupied housing. Also positively related to homicide in some census years, although not all, are the higher percentage of young residents in the neighbourhood, lower male and female labour force participation rates, higher percentages of vacant housing units, and less residential stability.<sup>34</sup> The results show that the neighbourhood features are associated with homicide in Buffalo are similar to those that have been found in other urban areas.

---

<sup>34</sup> While there are very few discrepancies between the bivariate correlations for homicide incidents compared to homicide rates, two inconsistencies are worthy of mention (see Table 3.51 compared to Table 3.52). First, when converting the homicide count into a rate, the positive relationship between the proportion of the young population and homicide disappears during the 1970s and 1980s. Second, in the

The decade in which the zero-order correlations deviate the most from the rest of the period under examination is the 1950s. In this decade, younger populations, rates of labour force participation, and vacant housing are not related to levels of homicide in neighbourhoods. Recall from earlier in the chapter that vacancies were particularly low and male labour force participation was particularly high during the 1950s. One possible explanation is that the more limited neighbourhood-level variation on these characteristics could be a source of these non-significant correlation coefficients. However Table 3.1 suggests that the neighbourhood-level variation in both male and female labour force participation was relatively large during the 1950s. These inconsistencies are explored further in Chapter 4.

The relationships between many of the exogenous variables and homicide are stronger when rates, rather than counts, are used. Overall, however, most of the relationships hold regardless of how homicide is measured, and there is consistency in significance and direction of the associations over much of this 50-year period. The decade of the 1950s is the exception. This preliminary analysis points to the possibility that the characteristics of neighbourhoods experiencing homicide in recent decades were not necessarily identical to the characteristics of neighbourhoods in which homicide was prevalent at mid-century.

### 3.5 CONCLUSION

In this chapter, I provided an overview of the demographic, socioeconomic, and housing-related trends in the city of Buffalo over the last five decades of the twentieth

---

1980s and 1990s, there is a significant and negative association between percent of females in the labour force and homicide rates, but not counts.

century. Over this period, Buffalo experienced an out-migration of almost half of its population and a growing proportion of African American residents segregated in particular neighbourhoods of the city. The labour force participation and educational attainment of Buffalo's residents were outpaced by national averages over the period, and poverty levels increased steadily after 1970 after declining in the 1950s and 1960s. The proportion of homes that were vacant climbed almost ten-fold, and the proportion of residents who were homeowners dropped marginally. Further, while African Americans increased their home ownership rates, this trend was restricted to predominantly African American neighbourhoods in Buffalo.

A closer look at distinctions between neighbourhoods on important demographic, socioeconomic, and housing features demonstrates clear differences among neighbourhoods over time. In general, neighbourhoods with higher proportions of African American residents tended to experience a wider range of disadvantages, including lower socioeconomic status, limited labour force participation, lower educational attainment, a proportionately younger population, and lower rates of owner-occupied housing. These neighbourhoods were also found to experience higher levels homicide, both numerically and in proportion to their populations – particularly in the later decades of the period under study. However, the analyses conducted in this chapter are descriptive and do not partial out the intercorrelations between the exogenous variables. That is, each of the relationships described above are bivariate and thus the shared variance between exogenous variables with one another and with the dependant variable, homicide, is not controlled for in the present analyses. Chapters 5 and 6 present multivariate analyses that alleviate these statistical concerns.

Homicide trends in Buffalo roughly mirrored patterns across the nation, increasing in the 1960s and 1970s, steadying in the 1980s, peaking in the early 1990s, and falling precipitously by the end of the century. My preliminary examination of neighbourhood-level trends in homicide, however, found markedly different patterns over time. In this chapter, I also examined bivariate relationships at the tract-level between homicide and demographic, socioeconomic, and housing-related characteristics at each decade. The results suggest that the types of neighbourhoods experiencing higher levels of homicide earlier in the postwar period were not necessarily the types of neighbourhoods experiencing higher levels of homicide in later decades – both in terms of geographic location and in terms of neighbourhood characteristics. The results of the preliminary analyses presented in this chapter point to the importance of treating neighbourhoods as the level-of-analysis, and provide a valuable backdrop for the more comprehensive statistical analyses undertaken in Chapters 5 and 6.

**TABLE 3.1: Descriptive Statistics for the City of Buffalo by Decade:  
Mean averaged across all tracts (N=72)**

	<b>1950</b>	<b>1960</b>	<b>1970</b>	<b>1980</b>	<b>1990</b>
<b>Total Population</b>	<b>580,132</b>	<b>532,759</b>	<b>459,915</b>	<b>356,102</b>	<b>326,747</b>
<b>Mean Tract Pop. (at mid-decade)</b>	7729 (4028) [1098-18587]	6894 (3409) [1055-16451]	5667 (2739) [924-13324]	4742 (2329) [617-10186]	4292 (2090) [545-9242]
<b>% African American</b>	3.9 (12.9) [0-89.4]	9.1 (21.6) [0-93.8]	15.5 (28.6) [0-97.6]	24.7 (33.2) [0-97.1]	28.7 (34.9) [0-98.2]
<b>% Hispanic/Latino</b>	---	---	1.7 (2.6) [0-15.6]	2.4 (4.0) [0-26.3]	4.1 (6.9) [0-42.8]
<b>% Young Pop. (under 18)*</b>	28.6 (5.2) [11.5-38.8]	33.6 (5.5) [17.6-44.5]	30.6 (7.5) [5.5-47.2]	25.1 (6.9) [3.7-42.3]	23.9 (6.3) [3.3-36.0]
<b>% Foreign Born</b>	11.9 (3.6) [2.0-22.7]	35.8 (11.0) [3.0-56.8]	7.6 (3.5) [0.1-15.2]	6.0 (3.2) [0.9-13.0]	4.2 (2.9) [0-11.9]
<b>% Completed High School (25+ yr old)</b>	29.6 (15.4) [10.5-66.5]	30.5 (14.4) [12.0-75.0]	38.9 (14.9) [15.6-79.7]	51.8 (15.0) [16.7-79.8]	65.0 (12.4) [24.0-86.8]
<b>% Males in Labour Force (16+ yr old)†</b>	80.1 (7.5) [23.9-86.7]	69.7 (9.4) [18.9-81.2]	72.2 (9.6) [16.2-89.4]	65.8 (10.4) [28.9-77.5]	64.9 (10.2) [31.0-86.4]
<b>% Females in Labour Force (16+ yr old)†</b>	30.4 (4.4) [11.5-46.9]	32.9 (6.1) [8.1-58.3]	40.2 (6.0) [17.9-58.9]	43.1 (7.2) [15.5-54.7]	50.3 (8.6) [15.3-68.1]
<b>% Below the Poverty Line ‡</b>	31.2 (10.8) [15.6-65.5]	16.4 (9.4) [5.8-49.9]	14.1 (9.2) [2.6-51.8]	20.5 (12.0) [2.7-55.2]	26.2 (13.6) [5.4-63.2]
<b>% Owner-Occupied Housing</b>	46.2 (14.3) [11.3-72.1]	45.9 (16.3) [2.1-71.3]	44.7 (15.9) [5.7-70.3]	41.8 (16.3) [0.7-70.0]	40.7 (15.5) [2.9-68.3]
<b>% Black Owner- Occupied Housing †</b>	0.7 (2.2) [0-11.2]	1.7 (5.0) [0-28.8]	4.7 (8.5) [0-38.7]	7.2 (11.6) [0-45.0]	7.9 (12.7) [0-49.9]
<b>% Vacant</b>	1.2 (0.5) [0.3-3.5]	2.6 (2.3) [0.6-15.2]	4.5 (3.2) [1.2-14.5]	9.5 (6.3) [1.8-37.5]	10.1 (7.3) [3.0-45.7]
<b>% Living in same House 5 years γ</b>	97.9 (0.8) [95.6-100.3]	56.3 (9.5) [28.4-70.2]	59.9 (9.4) [32.2-83.7]	58.5 (10.2) [30.6-79.6]	57.5 (10.1) [22.8-77.9]

Note: (Standard Deviation), [Range] --- data not available

\* persons under 20 years for 1950 and 1960 only

† labour force participation includes 14+ years old for 1950 and 1960 only

‡ see Appendix 3.IV for calculation of poverty lines by decade

† 1950 and 1960 figures include all non-white, 1970 through 1990 includes black only

γ residential stability measure for 1950 based on living in same house *one* year ago, not comparable to later decades

FIGURE 3.1

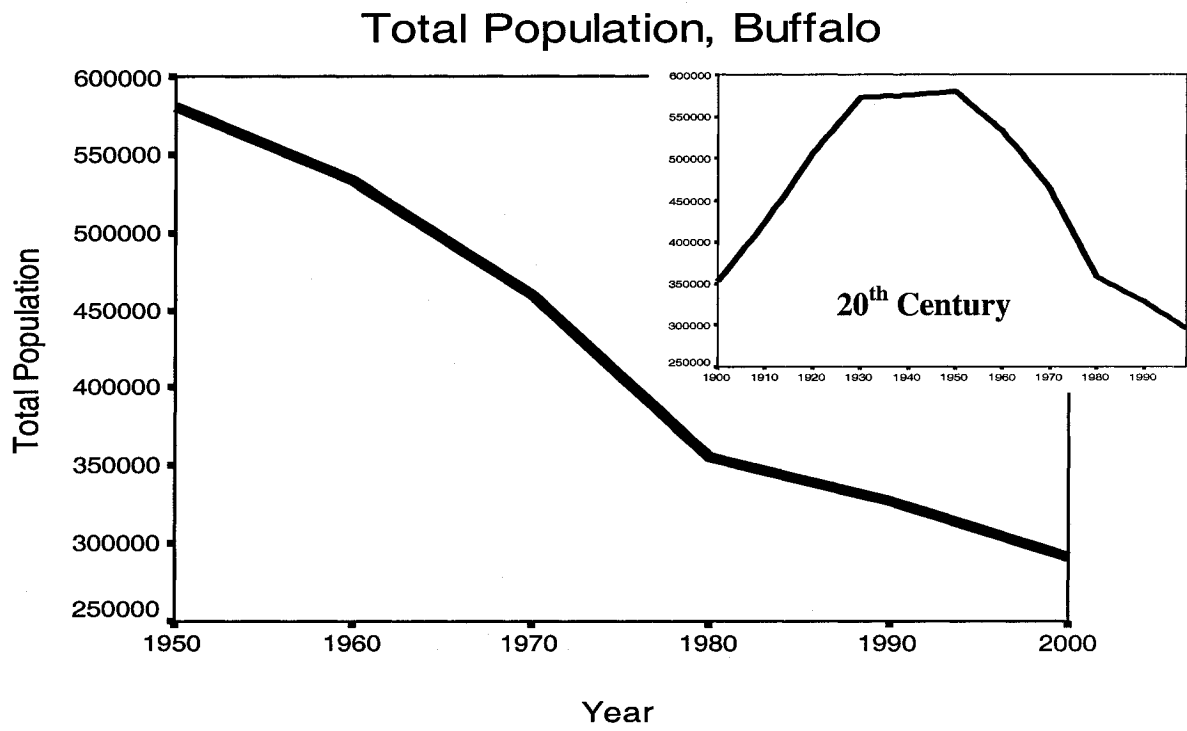


FIGURE 3.2

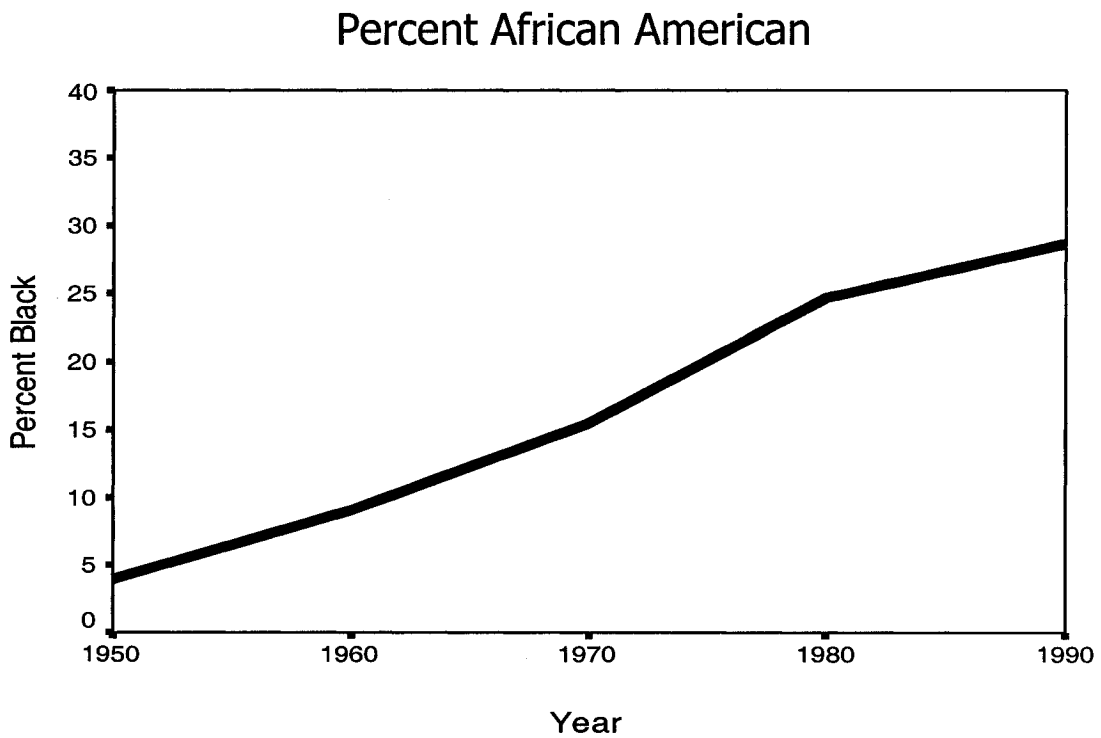




FIGURE 3.3

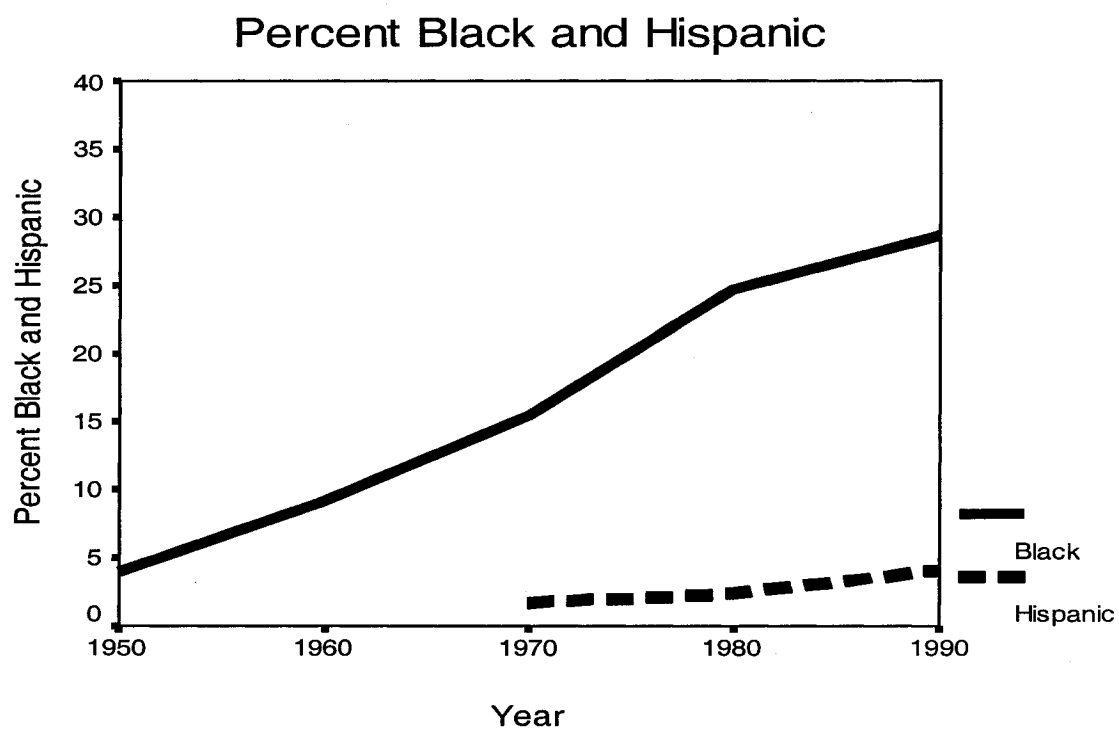
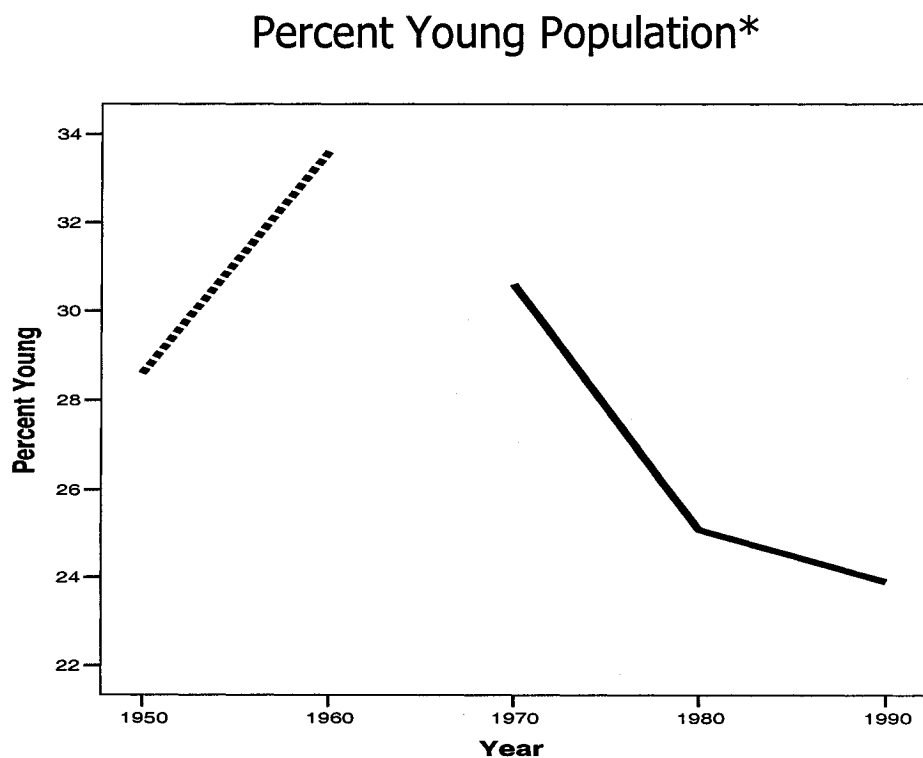


FIGURE 3.4



\*Persons less than 20 years of age for 1950 and 1960, less than 18 for 1970 through 1990

FIGURE 3.5

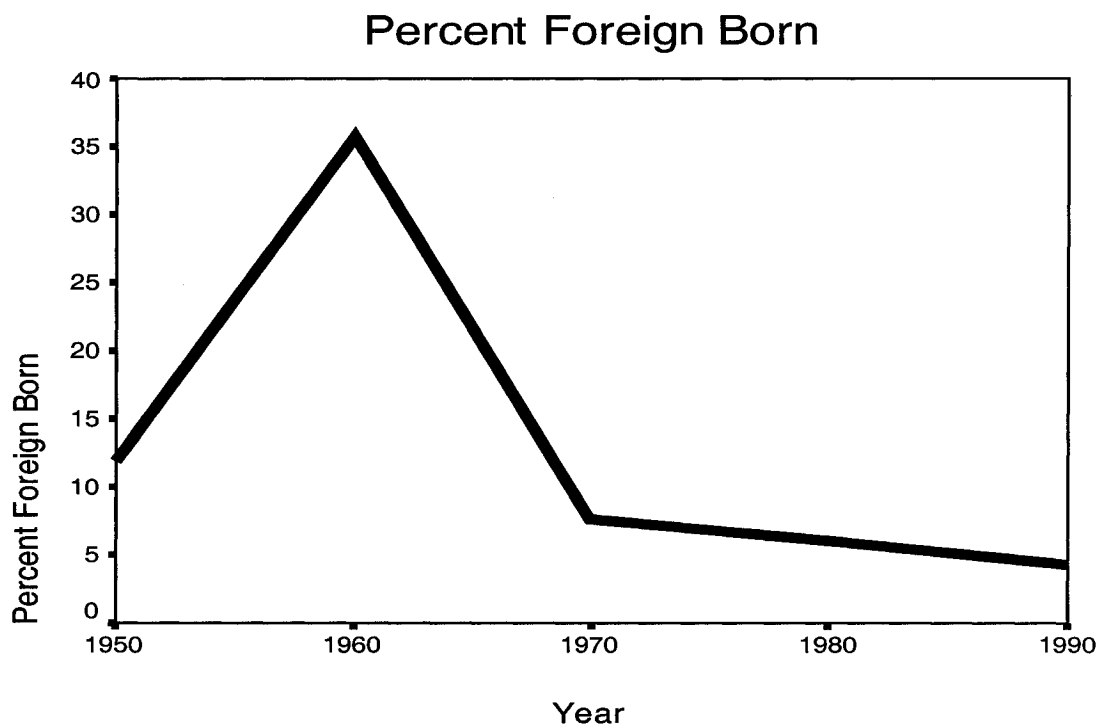


FIGURE 3.6

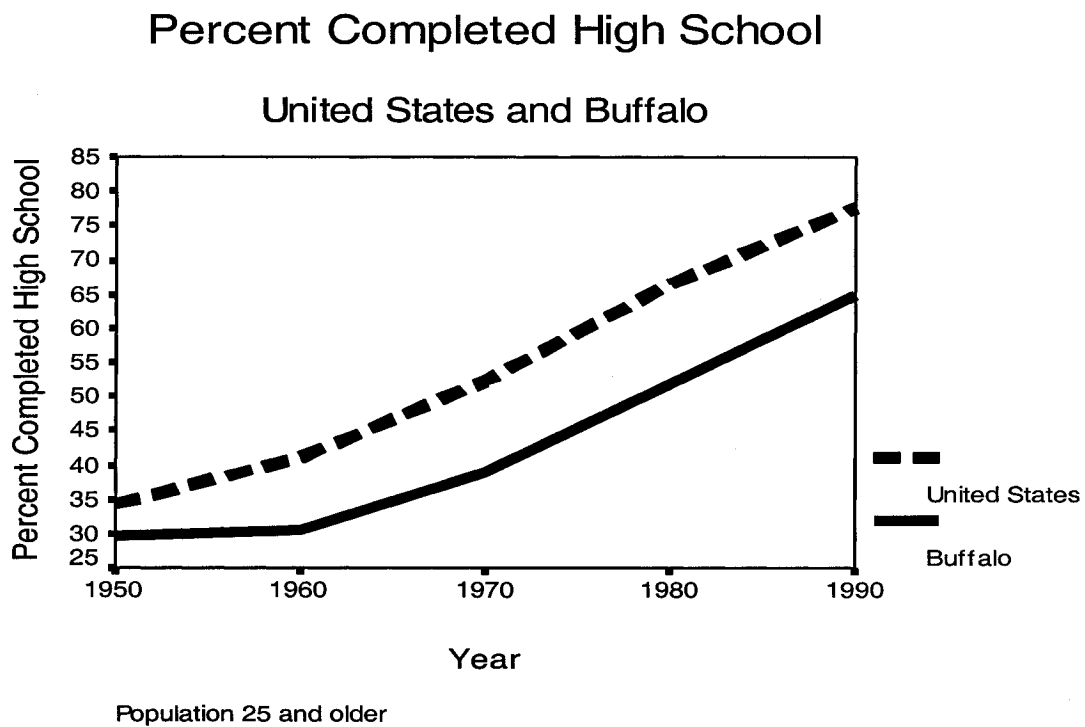
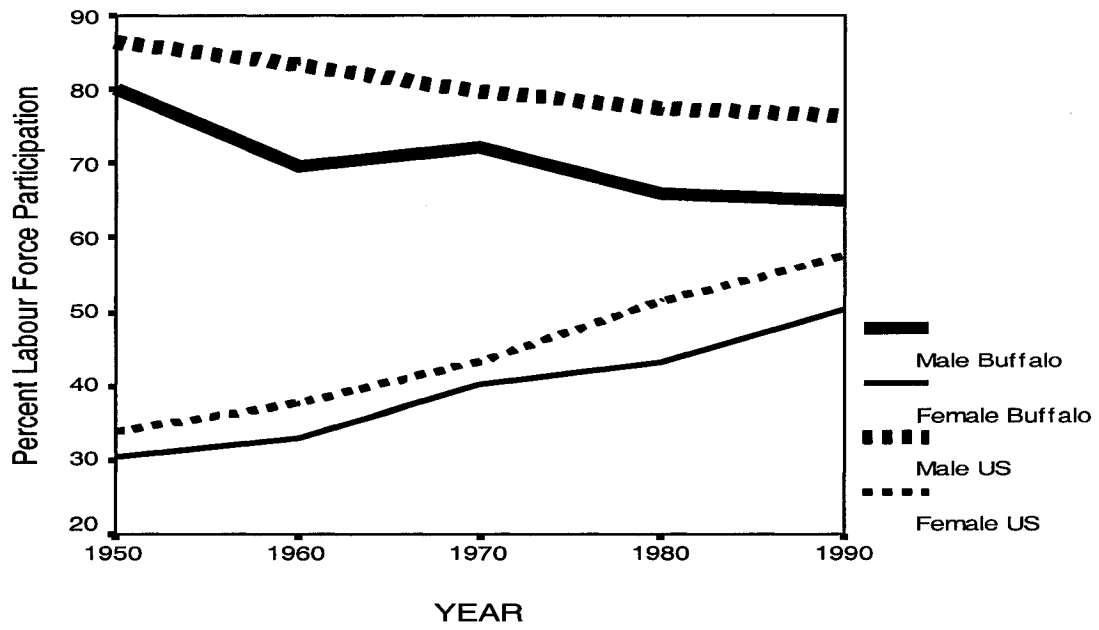


FIGURE 3.7

Percent in Labour Force by Sex,  
United States and Buffalo



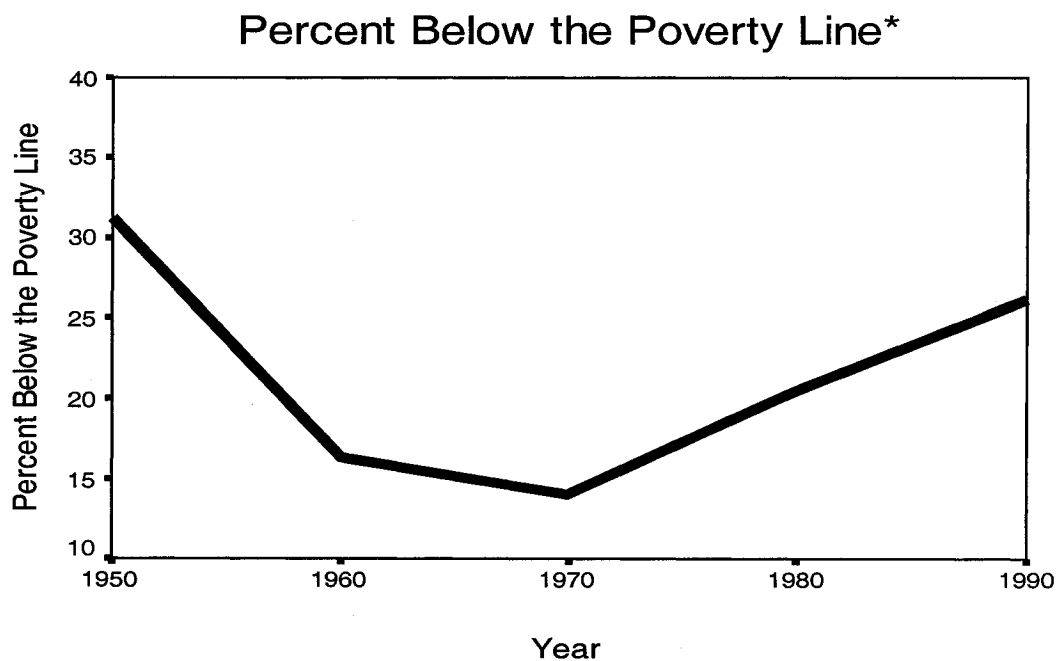
**TABLE 3.2: Descriptive Statistics for Percent Living Below the Poverty Line in Buffalo, 1950s through 1990s: Mean averaged across all tracts (N=72)**

	N	Range	Minimum	Maximum	Mean	Std. Deviation
1950 Percent income less than \$2499 *	72	49.90	15.57	65.48	31.23	10.77
1960 Percent income less than \$3000 †	72	44.09	5.84	49.93	16.42	9.41
1970 Percent below the poverty line	72	49.17	2.64	51.81	14.12	9.17
1980 Percent below the poverty line	72	52.51	2.67	55.18	20.47	12.04
1990 Percent below the poverty line	72	57.80	5.39	63.19	26.20	13.61
N	72					

\* Derived from Consumer Price Index, Bureau of Labor Statistics

† U.S. Census crude poverty definition

**FIGURE 3.8**



\*See Appendix 3.IV for construction of poverty line variables

FIGURE 3.9

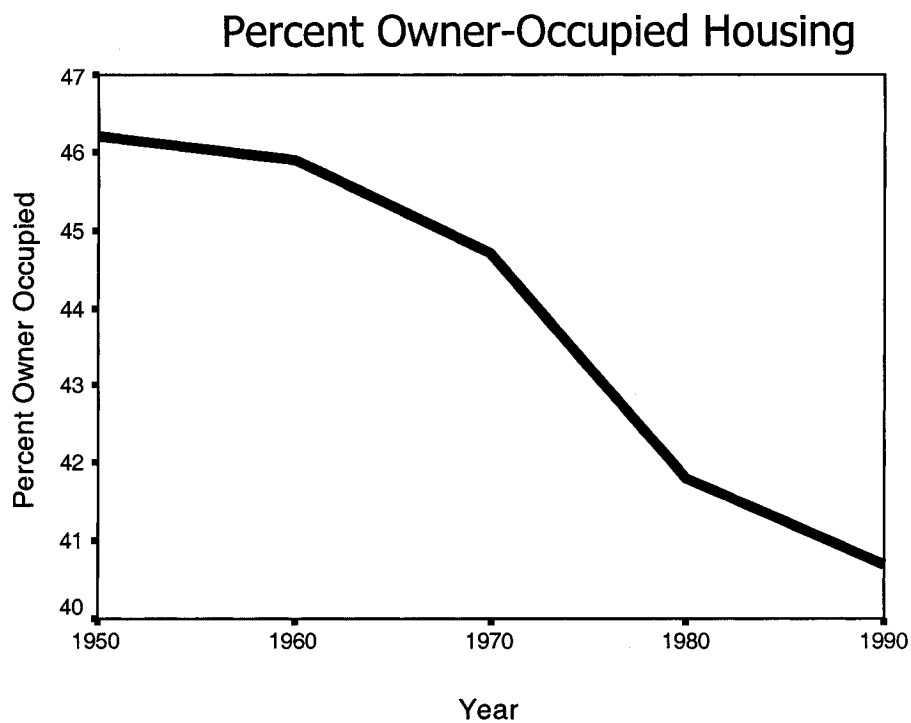


FIGURE 3.10

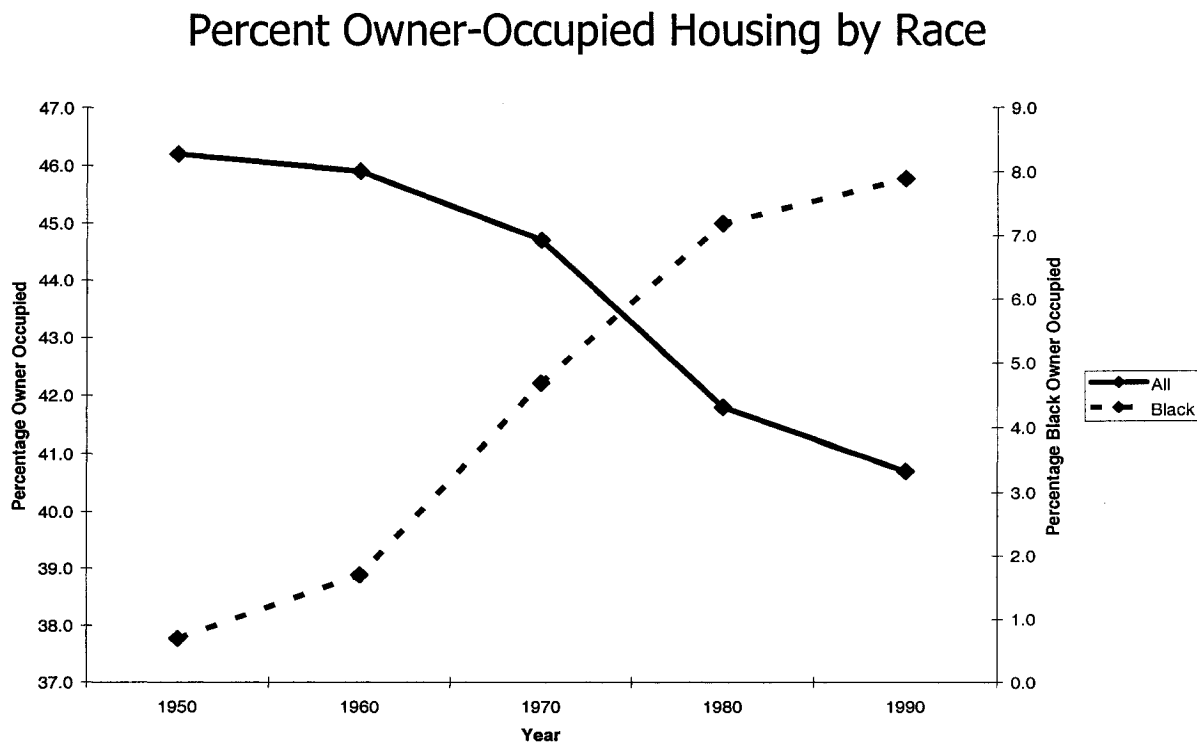


FIGURE 3.11

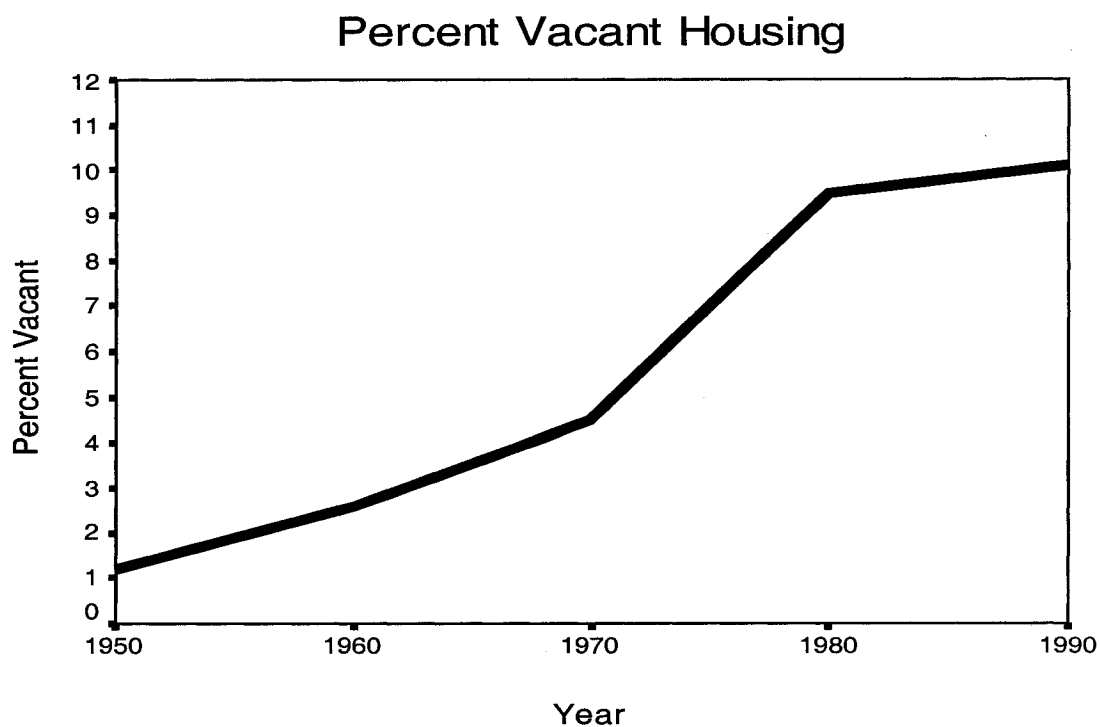
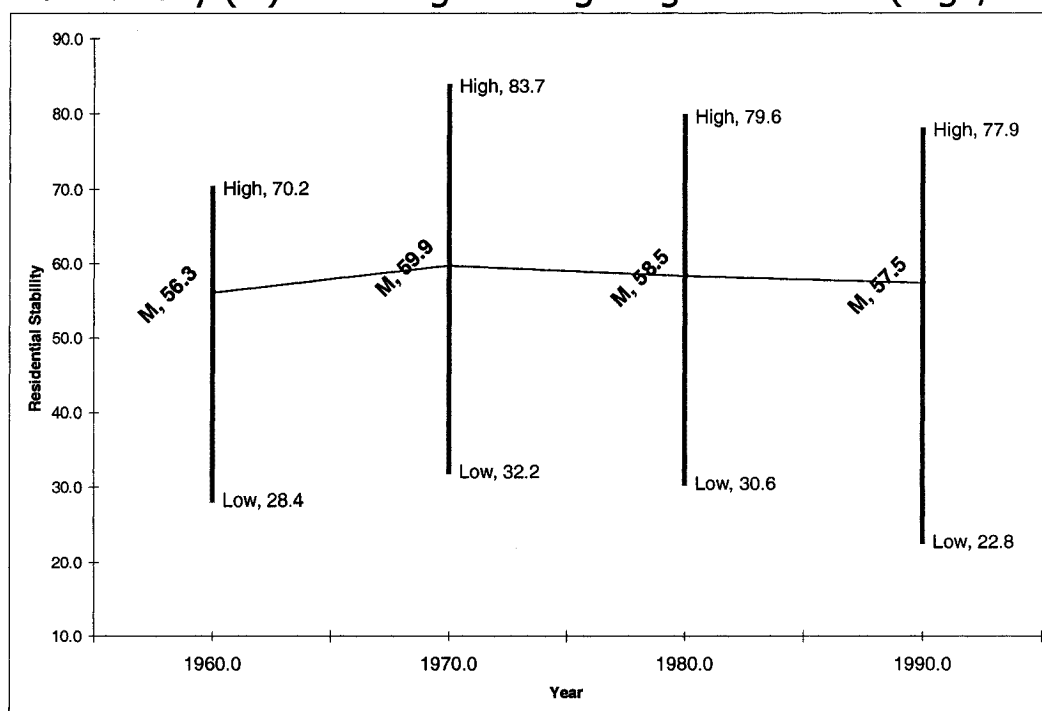


FIGURE 3.12

**Percent Residentially Stable:  
Mean for City (M) and Range among Neighbourhoods (High/Low)**



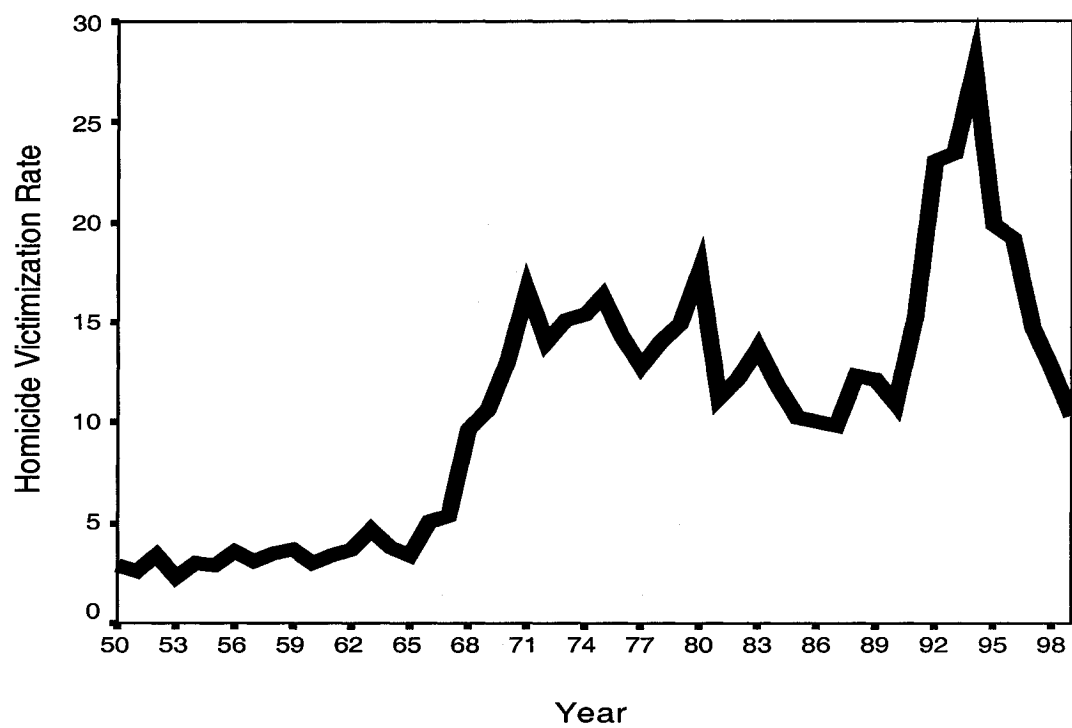
**TABLE 3.3: Bivariate Correlations among Demographic, Socioeconomic, and Housing Characteristics in Buffalo, 1950 through 1990**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) % African American	1										
(2) % Young Pop.	/++++	1									
(3) % Foreign Born	-----	/----	1								
(4) % High School Completed	-----	-----	//+++	1							
(5) % Male Labour Force	/----	+////	-+/++	/++++	1						
(6) % Female Labour Force	/-///	--///	/+//+	+++++	+++++	1					
(7) % in Poverty	+++++	-++++	/----	/----	-----	+----	1				
(8) % Owner-Occupied	-----	//////	/+///	+++++	+++++	-+/++	-----	1			
(9) % Black Owner-Occupied	+++++	//+++	-----	-/-//	//-/	//////	+++++	---//	1		
(10) % Vacant	/++++	//++/	/----	//---	/----	//---	+++++	-----	//++/	1	
(11) % Residential Stability	X-//	X///+	X+/-	X///	X+++/	X///	X---	X++++	X-//	X-//	1

Key: + p<=.05 Positive Correlation, - p<=.05 Negative Correlation, / Non Significant, X Not Consistent Measure over Time (1950 excluded)  
 Note: 1950, 1960, 1970, 1980, and 1990 direction and significance indicated in each column in chronological order

FIGURE 3.13

Total Homicide Victimization Rate per 100,000:  
Buffalo N.Y., 1950-1999





**TABLE 3.4**  
**Descriptive Statistics for Homicide in Buffalo Neighbourhoods by Decade:**  
**Mean averaged across all tracts (N=72)**

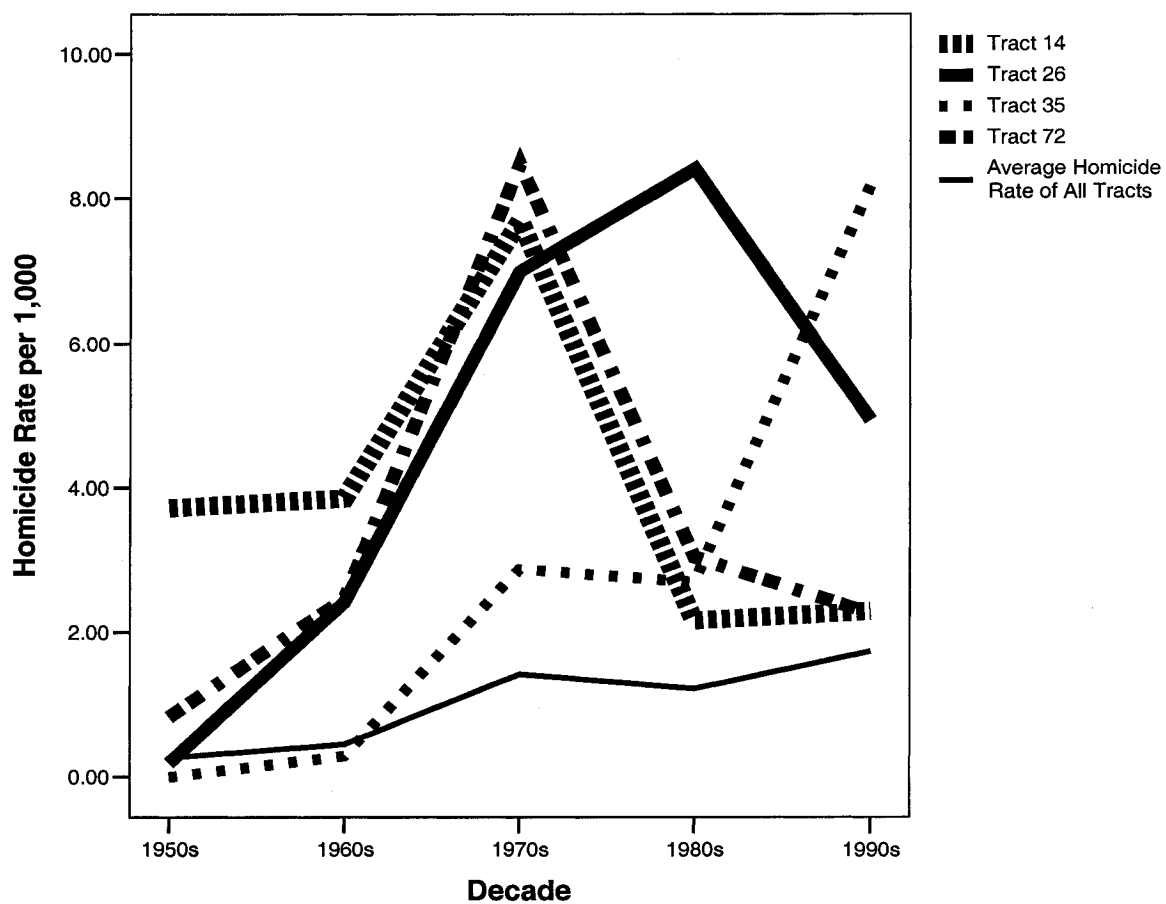
	Homicide Incidents (Counts)							Homicide Rate (per 1,000*)				
	Total Number	Average # hom. per tract	Standard Deviation across tracts	Range across tracts	Minimum # hom. per tract	Maximum # hom. per tract	Total Rate in city at mid-decade †	Average hom. rate across tracts	Standard Deviation across tracts	Range across tracts	Minimum hom. rate across tracts	Maximum hom. rate across tracts
<b>1950s</b>	157	2.18	6.11	46	0	46	.28	.26	.57	3.72	0	3.72
<b>1960s</b>	248	3.44	7.21	37	0	37	.50	.45	.82	3.86	0	3.86
<b>1970s</b>	584	8.11	12.24	50	0	50	1.43	1.42	1.97	8.48	0	8.48
<b>1980s</b>	397	5.51	6.74	28	0	28	1.16	1.22	1.53	8.41	0	8.41
<b>1990s</b>	569	7.90	10.25	45	0	45	1.84	1.74	1.87	8.19	0	8.19

\*The homicide rate is calculated as the total number of homicides in a tract for the entire decade divided by the average population of the tract in the same decade (the mid-decade linear extrapolation of total population between census years) x 1000

† Homicide rate per 1,000 at mid-decade (i.e. 1955 for 1950s)

FIGURE 3.14

## Average Homicide Rate for each Decade, for Selected High-Rate Tracts in Buffalo



**TABLE 3.5a**  
**Bivariate Correlations between Demographic, Socioeconomic, and Housing Characteristics with Homicide Count (3.51) and Homicide Rate (3.52) in Buffalo Neighbourhoods by Decade**

<i>Number of Homicides in Tract</i>	% African American	% Young Pop.	% Foreign Born	% High School Completed	% Male Labour Force	% Female Labour Force	% in Poverty	% Owner-Occupied	% Black Owner-Occupied	% Vacant	% Residential Stability
<i>1950s</i>	.942**	.123	-.292*	-.276*	-.079	-.016	.578**	-.479**	.791**	.036	X
<i>1960s</i>	.864**	.271*	-.601**	-.319**	-.375**	-.257*	.748**	-.570**	.594**	.314**	-.588**
<i>1970s</i>	.847**	.344**	-.434**	-.335**	-.358**	-.064	.684**	-.594**	.662**	.674**	-.360**
<i>1980s</i>	.653**	.251*	-.259*	-.343**	-.401**	-.167	.633**	-.455**	.530**	.568**	-.169
<i>1990s</i>	.658**	.397**	-.241*	-.269*	-.387**	-.218	.538**	-.385**	.539**	.269*	-.197

**TABLE 3.5b**

<i>Homicide Rate in Tract</i>	% African American	% Young Pop.	% Foreign Born	% High School Completed	% Male Labour Force	% Female Labour Force	% in Poverty	% Owner-Occupied	% Black Owner-Occupied	% Vacant	% Residential Stability
<i>1950s</i>	.790**	.159	-.269*	-.350**	-.088	-.036	.474**	-.435**	.639**	.021	X
<i>1960s</i>	.817**	.323**	-.610**	-.330**	-.445**	-.314**	.827**	-.662**	.453**	.508**	-.604**
<i>1970s</i>	.750**	.220	-.421**	-.352**	-.538**	-.115	.758**	-.687**	.591**	.771**	-.446**
<i>1980s</i>	.653**	.215	-.342**	-.490**	-.557**	-.400**	.621**	-.495**	.442**	.659**	-.115
<i>1990s</i>	.772**	.376**	-.361**	-.496**	-.526**	-.406**	.737**	-.481**	.581**	.465**	-.127

Key: Two-tailed \* p<=.05, \*\* p<=.01, X Not Consistent Measure

## **CHAPTER IV. HOMICIDE IN BUFFALO NEIGHBOURHOODS**

This chapter provides an overview of general trends in neighbourhood homicide and in neighbourhood demographic, socioeconomic, and housing characteristics between 1950 and the end of the twentieth century in Buffalo. Three central questions drive the analyses presented in this chapter. First, how much stability is there in the distribution of homicide across Buffalo's neighbourhoods? That is, are the most violent neighbourhoods at the beginning of the period also the most violent neighbourhoods at the end of the period? Second, did homicide diffuse across neighbourhoods in Buffalo and, if so, how? And finally, to what extent are any changes in the distribution of homicide across Buffalo neighbourhoods accompanied by changes in traditional neighbourhood-level correlates of violence between the 1950s and the 1990s?

Chapter 4 is organized into two main sections. In section 4.1, I explore temporal evidence for stability, diffusion, and the relationship between neighbourhood characteristics and levels of homicide; and in section 4.2, I explore the spatial evidence for these same three issues. This descriptive analysis serves as the groundwork for the more extensive explanatory modeling that comprises Chapters 5 and 6.

### **4.1 HOMICIDE IN NEIGHBOURHOODS OVER TIME**

#### **4.1.1 Is there Stability in Homicide Counts and Rates?**

In this section I examine the extent to which Buffalo neighbourhoods that were relatively violent in the early postwar period remained violent over time. In other words, did particular neighbourhoods remain the primary source of homicide in the city over half a century (from 1950 to 1999)? Here, the purpose is to establish whether there was

stability in where homicide occurred in the city, using as a baseline the amount of homicide in neighbourhoods in the immediate postwar period.

The zero-order correlation matrices provided in Tables 4.1 and 4.2 demonstrate evidence of *short-term* stability, but an apparent lack of *long-term* continuity in the neighbourhoods experiencing higher levels of homicide in Buffalo over the five decades. The correlation matrix in Table 4.1 illustrates the strength of the relationship between total *counts* of homicide within neighbourhoods for each decade by total counts for the remaining four decades of the postwar period. The results show that the strength of the correlations tends to decrease as the time span increases. However, the interpretation of these findings is not clear. They may suggest that homicide incidents shifted to new and different neighbourhoods, or they may simply be a consequence of a growing total number of homicides in the city over time.<sup>35</sup> In this latter case, the *count* of homicides in any given neighbourhood could differ from decade to decade, even while the homicide *rate* could have remained stable. Thus, correlation matrices for both the count (see Table 4.1) and rate (see Table 4.2) of homicides in neighbourhoods over the postwar period are provided for comparison.

The within-neighbourhood correlation between the homicide count (or rate) in each decade and the homicide count (or rate) in the following decade is provided on the first diagonal of both Table 4.1 and Table 4.2 respectively. The results are largely similar, whether the homicide count or the homicide rate is examined. For instance, there is a strong ( $b = 0.799$  to  $0.869$ ) and statistically significant ( $p \leq .01$ ) zero-order correlation between the number of homicides in the city's 72 census tracts in any one

---

<sup>35</sup> Recall that in Buffalo there were a total of 1,955 total homicide victims with valid incident location data; however the number of cases varied across decades. In all, there were 157 homicides in the 1950s, 248 in the 1960s, 584 in the 1970s, 397 in the 1980s, and 569 in the 1990s.

decade (from 1950 onward) and the number of homicides in the following decade. There are similarly strong ( $b = 0.689$  to  $0.861$ ) and statistically significant ( $p \leq .01$ ) zero-order correlations for homicide rates. This suggests that there is substantial stability in the geographic distribution of homicide across the city from one decade to the next. In other words, neighbourhoods experiencing a certain level of homicide – whether measured by counts or rates – in one decade were likely to experience a similar level of homicide in the following decade. Note that *both* neighbourhood homicide counts *and* rates demonstrate remarkable congruence across single decade comparisons, even as Buffalo residents were migrating out of the city over the postwar period. This correlational analysis indicates, then, that changes in the magnitude of the total population at risk did not markedly affect the relative ranking of neighbourhoods on their homicide levels across a single decade.

When each decade is compared to the second-order decade (i.e., 1950s compared to 1970s, or 1960s compared to 1980s), there again is a statistically significant relationship for each of the comparisons ( $p \leq .01$ ) but the correlation coefficients drop considerably in each case ( $b = 0.504$  to  $0.670$  for count;  $b = 0.567$  to  $0.684$  for rate). This suggests that there is moderate stability in the homicide count and rate over a twenty year period within Buffalo neighbourhoods. The reduction in the size of the correlation coefficients indicates some shift in homicide counts and rates within neighbourhoods over twenty years.

A comparison of the correlations in both Table 4.1 and 4.2 illustrate that the findings for within-neighbourhood homicide counts compared to within-neighbourhood homicide rates begin to diverge when examined over more than 20 years. For homicide

counts, there is only one statistically significant relationship. In this case, the count of homicides within tracts during the 1960s is weakly correlated with the count of homicides in the same tracts during the 1990s ( $b = 0.271$ ,  $p \leq 0.05$ ). The count of homicides within tracts during the 1950s is not significantly correlated with either the 1980s or 1990s homicide count.

Recall, however, that the total population of the city of Buffalo declined dramatically over the second half of the twentieth century, and thus the correlations among neighbourhood homicide counts may be influenced more by changes in the underlying population at risk than by changes in relative exposure to violence. This is increasingly likely as the time elapsed between comparisons grows, due to the cumulative decline in the city population. In fact, Table 4.2 shows that the correlation coefficients between homicide rates three decades apart (i.e., 1950s to 1980s and 1960s to 1990s) are higher than in Table 4.1. There is a statistically significant ( $p \leq 0.01$ ), though moderate correlation between homicide rates in neighbourhoods thirty years apart ( $b = 0.305$  between the 1950s and the 1980s and  $b = 0.406$  between the 1960s and the 1990s). Neighbourhood homicide rates or counts in the 1950s were not significantly related to either rates or counts in the 1990s.

These preliminary results suggest two things. First, there is relatively strong stability in both homicide rates and counts within neighbourhoods across ten year increments. Second, over the long term, this stability begins to diminish. This point is further illustrated in the scatterplots of neighbourhood homicide counts by pairs of decades (see Figure 4.1; enlarged versions of the figures from Chapter 4 are available in Appendix 4.IV). From these figures, it is evident that many of the neighbourhoods with

no homicides in the 1950s experienced homicides in later decades. These scatterplots for the 1950s also graphically reveal the presence of an outlier in the downtown core (tract 14). This census tract accounted for almost one third of all homicide incidents in the 1950s (46 of 157 or 29.3 percent), but only 14.9 percent of homicides in the 1960s, 8.6 percent in the 1970s, 2.0 percent in the 1980s and 1.4 percent in the 1990s. While only suggestive at this point, these results imply that the neighbourhoods experiencing the most homicide in the 1950s were generally not the neighbourhoods experiencing the most homicide near the end of the century.

#### **4.1.2 Preliminary Evidence for the Diffusion of Homicide across Neighbourhoods**

The correlation coefficients provided above describe some stability, albeit relatively circumscribed in time, in homicide within neighbourhoods. They also show changes in within-neighbourhood homicide rates and counts over longer periods. One could argue that these results are *suggestive* of a diffusion process that altered the distribution of homicide across Buffalo neighbourhoods. To assess whether homicide affected an increasing number of neighbourhoods over time, I present two different sets of descriptive analyses below. First, I examine the proportion of neighbourhoods that experience varying counts of homicide in each of the five decades. Then I present a comparison of changes in the within-neighbourhood concentration of homicide at each period with an across-neighbourhood measure of homicide dispersion over time. Neither of these analyses can definitively prove that diffusion was responsible for a changing distribution of homicide across Buffalo's neighbourhoods over time. Such a conclusion could only be drawn by examining changes in the spatial distribution of homicide



between the 1950s and the 1990s (these analyses comprise section 4.2). What the present analyses do is provide preliminary evidence to confirm that the distribution of homicide changed both within and across neighbourhoods in Buffalo.

Table 4.3 presents data on the number of neighbourhoods experiencing different counts of homicide in each of the five post-WWII decades. I classified neighbourhoods into one of three categories: those with no homicides, those with only one homicide, and those with two or more homicides in each decade. I selected these somewhat crude categories after inspecting the number of homicides in each of the 72 tracts over the postwar era.<sup>36</sup> Neighbourhoods exhibiting two or more homicides comprised a relatively small group during the first two census decades, however more than 70 percent of neighbourhoods had experienced two or more homicides in the final decade of the century.

The mean and range shown in Table 4.3 for each decade indicate the average count of homicides per tract as well as the count of homicides occurring in the least and most violent tracts during each respective decade. In the 1950s, there were 32 tracts with no homicides (44.4 percent), 25 tracts with only one homicide (34.7 percent), and 15 tracts with two or more incidents (20.8 percent). Almost 80 percent of tracts in the city then had fewer than two homicides during the 1950s. In the 1960s, 66.7 percent of neighbourhoods had fewer than two homicides, but this figure dropped substantially to 30.6 percent during the 1970s, 37.5 percent during the 1980s, and 29.2 percent during the 1990s.

---

<sup>36</sup> Given that the five decades cover a period when levels of homicide ranged from very low to very high, it becomes difficult to establish a useful and consistent categorization of homicide levels across each decade. If one were to use a cut-off of three or more homicides, for instance, fewer than 10 percent of census tracts in the 1950s would fall into this category. By the 1990s, however, more than 55 percent of census tracts experienced three or more homicides.

Of particular interest in Table 4.3 is the number of census tracts classified in each of three homicide categories by decade. In the 1950s and 1960s, there were more than twice as many tracts with no homicides as there were in each of the later decades (32 and 27 in the 1950s and 1960s respectively, compared to 12, 12, and 13 in the 1970s, 1980s, and 1990s respectively). By contrast, in the three later decades there were more than twice as many tracts with two or more homicides compared to the 1950s and the 1960s (50, 45, and 51 in the 1970s, 1980s, and 1990s respectively, compared to 15 and 24 in the 1950s and 1960s respectively). These figures indicate that, at the same time as the overall level of homicide was increasing, homicide was affecting many *more* neighbourhoods in Buffalo from the 1970s onward. Such a finding is at least suggestive of a diffusion of homicide to a larger group of neighbourhoods over time.

Another method by which to examine how the distribution of homicide varied across neighbourhoods in Buffalo over five decades is to compare internal levels of homicide (or the *within-neighbourhood concentration*) with the proportion of neighbourhoods experiencing any homicide (or the *across-neighbourhood dispersion*) of homicide over time. I define within-neighbourhood homicide *concentration* (the broken line in Figure 4.2) as the mean count of homicides in neighbourhoods that experienced *any* homicide for each decade. Between the 1950s and the 1970s, the mean count of homicides in tracts experiencing any homicide increased by 148 percent from just under four homicides per tract in the 1950s to just under 10 homicides per tract by the 1970s. The concentration or number of homicides in neighbourhoods experiencing any homicide declined between the 1970s and the 1980s by 32 percent, before rising again by 46 percent between the 1980s and the 1990s. This suggests that the volume (or the *with-in*

*neighbourhood concentration*) of homicides increased in neighbourhoods that experienced *any* homicide during each decade, save for the 1980s. It does not, however, reveal anything about the spatial concentration of neighbourhoods experiencing homicide in Buffalo.

*Dispersion* (the solid line in Figure 4.2) is defined as the percentage of neighbourhoods in Buffalo that experienced *any* homicides for each decade. The results show a dramatic rise in the percentage of tracts with any homicide between the 1950s and the 1970s followed by a relatively stable percentage of tracts experiencing homicide for the remainder of the period. This trend shows a dispersion of homicide to more and more tracts during the 1950s and 1960s; however, no additional dispersion of homicide across neighbourhoods in Buffalo is evident between the 1970s and the 1990s. Thus, the increase in mean homicide counts and rates across tracts over the period (see Figure 4.3) was initially associated with an increasing within-neighbourhood concentration of homicide coupled with a dispersion of homicide to an ever greater number of tracts during the 1950s and 1960s. However later in the century, the overall trend in neighbourhood homicide rates and counts were associated primarily with changes in the concentration of homicide within neighbourhoods, rather than a continued dispersion of homicide across neighbourhoods. That is, during the 1980s when Buffalo experienced a decline in total homicide, this decline took the form of a decrease in the mean number of incidents in neighbourhoods with any homicides. The total proportion of neighbourhoods that experienced any homicide, however, did not decline.

Taken together, these results indicate that even while the overall homicide rate in the city increased over time, this increase was not confined to neighbourhoods that had

the highest levels of homicide in the 1950s and 1960s. Rather, at the same time that the citywide homicide rate was increasing, homicide was occurring in more (and possibly different) neighbourhoods. The geographic distribution of homicides in Buffalo will be explored in section 4.2 of this chapter; however the results in both Table 4.3 and Figure 4.2 imply that homicide was diffusing to a greater number of neighbourhoods, particularly during the 1950s and the 1960s. There were, however, 26 neighbourhoods (36 percent of tracts) in Buffalo that experienced *at least one homicide in each of the five decades* under examination.<sup>37</sup> Taken together, these results imply at least some stability in the neighbourhoods where homicide occurred in Buffalo over the entire postwar period. However, the findings also provide evidence for a potential diffusion of homicide to a larger number of neighbourhoods, particularly during the 1950s and 1960s.

#### **4.1.3 Demographic, Socioeconomic, and Housing Characteristics of Neighbourhoods by Homicide Count Categories**

In Chapter 3, I described trends in demographic, socioeconomic, and housing characteristics for Buffalo as a whole. In many cases these characteristics varied widely across neighbourhoods over time. I also illustrated above that the distribution of homicide across the city was uneven over the same period. In this section, I explore whether the neighbourhood characteristics discussed in Chapter 3 varied with neighbourhood homicide levels in ways one would expect based on what is known about the social ecology of homicide. That is, I provide evidence about the extent to which demographic, socioeconomic, and housing characteristics were associated with homicide in neighbourhoods in each of the postwar decades. The analysis determines whether

---

<sup>37</sup> A map of the location of these 26 neighbourhoods is provided in Appendix 4.I.

neighbourhood characteristics associated with homicide early in the period were the same characteristics associated with homicide near the end of the century.

The following sections describe trends in each of the independent variables across neighbourhoods classified into the three categories outlined in the previous section. That is, I explore how the demographic, socioeconomic, and housing characteristics introduced in Chapter 3 are distributed across each of the three neighbourhood categories distinguished by homicide counts (i.e. those characterized by no homicides, one homicide, and two or more homicides).

### **DEMOGRAPHIC TRENDS**

I first consider whether the percentages of African American, young, and foreign born residents vary across the three neighbourhood homicide categories in each of the five decades.<sup>38</sup> Figure 4.4 shows that neighbourhoods with two or more homicides have significantly larger proportions of African American residents compared to tracts with fewer homicides in each of the postwar decades.<sup>39</sup> By contrast, there was no statistically significant difference between the percentages of the African American population in neighbourhoods with no homicides compared to those with one homicide. The results show that during the 1950s in neighbourhoods devoid of homicide, less than one percent of the residents were African Americans, and neighbourhoods with only one homicide averaged less than two percent African American residents. However, in the 15 (of 72) tracts with two or more homicides during the 1950s almost 16 percent of the population

---

<sup>38</sup> Appendix 4.II provides tables from which Figures 4.4 to 4.14 were compiled. These tables identify the means and standard deviations of each of the independent variables by neighbourhood homicide count (zero, one, and two or more). There are a total of five tables, one for each decade. Data from each of the five tables are compiled into Figures 4.4 to 4.14 for ease of longitudinal comparison.

<sup>39</sup> Significant differences between neighbourhoods experiencing zero, one, and two or more homicides are denoted in Figures 4.4 to 4.14 with the following notation: 1) 0 versus 1 homicide [ $* p \leq 0.05$ ], 2) 1 versus 2 or more homicides [ $\dagger p \leq 0.05$ ], and 3) 0 versus 2 or more homicides [ $\gamma p \leq 0.05$ ]. These are independent samples T-Tests where equal variances are not assumed.

was African American. The average proportion of African American residents in neighbourhoods with two or more homicides during each of the postwar decades rose steadily, save for a slight decline in the 1970s which reversed itself in the 1980s. By the 1990s, the average proportion of African Americans in neighbourhoods with two or more homicides exceeded 38 percent. By contrast, neighbourhoods with no homicides in the 1990s averaged seven percent African American, and those with only one homicide averaged just over two percent African American.

In contrast to the co-variation between neighbourhoods categorized by levels of homicide and the African American population, there is almost no co-variation between either percent young or percent foreign born and neighbourhoods with differing levels of homicide in each of the postwar decades. Figure 4.5 shows an increase in the percentage of the young population residing in Buffalo neighbourhoods until the 1960s followed by a steep decline. While neighbourhoods with two or more homicides in four of the five decades (the 1970s are the exception) averaged a slightly higher proportion of young residents, these differences were minor and not statistically significant. The only significant difference in the proportion of young residents among these neighbourhood categories was in the 1960s; in neighbourhoods with one homicide, young residents accounted for 31.5 percent of the population and in neighbourhoods with two or more homicides young residents accounted for 35.9 percent of the population.

Comparisons across neighbourhood homicide categories for percent foreign born show even fewer differences (see Figure 4.6). Percentage foreign born did not vary among the three neighbourhood categories during any of the postwar decades.<sup>40</sup>

---

<sup>40</sup> Appendix 4.III provides two Tables (4.10 and 4.11) of bivariate correlations that help to illustrate how neighbourhood homicide count could be significantly correlated with percent foreign born and percent

Thus only one of these three demographic characteristics, percentage of the population who were African American, clearly distinguishes neighbourhoods experiencing different levels of homicide at each period. Differences in the age structure and immigrant composition of neighbourhoods categorized by homicide counts were absent for the entire period under study.

### **SOCIOECONOMIC TRENDS**

The socioeconomic features of Buffalo neighbourhoods proved better at distinguishing among neighbourhoods classified by their homicide counts. As shown in Figure 4.7, the overall increase in high school attainment in Buffalo occurred in all neighbourhoods regardless of their homicide levels. However, some significant differences in educational attainment emerged in the earlier decades of the post WWII era. During the 1950s and 1960s, neighbourhoods experiencing two or more homicides had significantly smaller proportions of residents attaining a high school diploma compared to neighbourhoods with fewer homicides. For example, in the 1950s less than 20 percent of residents in the 15 neighbourhoods with two or more homicides completed high school, compared to almost 30 percent in neighbourhoods with one homicide, and close to 35 percent in neighbourhoods with no homicides. By the 1960s the average proportion of residents attaining a high school diploma had only reached 23 percent in the most violent neighbourhoods compared to 36 percent in neighbourhoods with only one homicide and 34 percent in neighbourhoods with no homicides. Of note, the more

---

young in Table 3.5a, and yet uncorrelated to the homicide count categories that differentiate tracts in Figures 4.5 and 4.6. Tables 4.10 and 4.11 (in Appendix 4.III) show that the negative relationship between homicide counts and percent foreign born, and the positive relationship between homicide counts and percent young are both driven largely by census tracts with high numbers of homicides. That is, the correlations shown in Table 3.5a were produced by the variation within the “2 or more incidents” homicide category.

violent neighbourhoods in each decade gained ground on the less violent neighbourhoods with no statistically significant differences emerging in educational attainment across neighbourhood categories by the end of the period. That is, the ability of educational attainment to distinguish violent from non-violent neighbourhoods appears to be historically contingent.<sup>41</sup>

Figure 4.8 shows the trends for male labour force participation in neighbourhoods categorized by homicide counts across the five decades. Unlike educational attainment, labour force participation by males shows a consistent pattern over time. In this case, neighbourhoods with two or more homicides had significantly lower levels of male labour force participation compared to neighbourhoods with fewer homicides at each decade. This disparity grew over time. In the 1950s, male labour force participation averaged a low of 78 percent in neighbourhoods with two or more homicides, compared to 82 percent in neighbourhoods with no homicides. However, by the 1990s the average proportion of males in the labour force was 63 percent in neighbourhoods with two or more homicides over the decade compared to 70 percent in neighbourhoods with no homicides. These differences remained statistically significant.

There were few differences in levels of female labour force participation across the three neighbourhood categories in each decade (see Figure 4.9). Only in the 1960s and 1970s were there, on average, proportionately fewer women in the labour force in neighbourhoods with two or more homicides compared to neighbourhoods with no homicides (significant in the 1970s) and/or one homicide (significant in the 1960s). In

---

<sup>41</sup> The compulsory school attendance law in New York State, enacted in 1874, requires that children between 6 and 16 years of age be enrolled in school (Department of Education 2004). Thus, the differences in neighbourhood-level high school completion during the 1950s and 1960s cannot be accounted for by school leaving laws.



fact, neighbourhoods with one homicide at each decade actually had higher female labour force participation compared to neighbourhoods with no homicides, except for the 1970s. However, these differences were not statistically significant.

The proportion of neighbourhood residents living below the poverty line was a strong and consistent discriminator of neighbourhoods with two or more homicides compared to the other two neighbourhood homicide categories at every time period (see Figure 4.10). In the 1950s, an average of 42 percent of the population lived below the poverty line in neighbourhoods with two or more homicides compared to 31 percent in neighbourhoods with one homicide and 30 percent in neighbourhoods with no homicides. The citywide mean stood at 31 percent (see Table 3.2 in Chapter 3). Not surprisingly then, the 15 neighbourhoods experiencing two or more homicides in the 1950s had dramatically higher levels of poverty compared to neighbourhoods with fewer homicides. Figure 4.10 shows that all neighbourhoods experienced a drop in poverty through the 1970s before rising again through the 1990s. However, by the 1990s the average percent of residents living below the poverty line in neighbourhoods with two or more homicides was nearly twice as high (30 percent) as that in places with zero homicides (18 percent) and places with one homicide (13 percent).

In sum, lower levels of male labour force participation and a higher proportion of residents in poverty were both distinguishing features of the more violent neighbourhoods over the postwar period. Early in the period, lower educational attainment characterized neighbourhoods with higher levels of violence; however this did not distinguish highly violent neighbourhoods from less violent neighbourhoods later in

the period. Female labour force participation rates differed very little across neighbourhoods classified by their homicide counts.

### HOUSING TRENDS

An examination of how the housing variables described in Chapter 3 are distributed across neighbourhoods classified by homicide counts reveals some important distinctions. Those neighbourhoods experiencing two or more homicide incidents had significantly lower home ownership compared to less violent neighbourhoods in each of the five postwar decades (see Figure 4.11). No significant differences in home ownership rates exist between neighbourhoods experiencing zero homicides per decade and those experiencing one homicide per decade. In the 1950s, 53 percent of residents in neighbourhoods with no homicides and 47 percent of residents in neighbourhoods with one homicide owned their own homes, yet in neighbourhoods experiencing two or more homicides only 31 percent of residents were homeowners. Over the entire postwar period the relative proportions of homeowners changed little across neighbourhood types; 51 and 52 percent of residents owned their own homes in neighbourhoods with zero and one homicide respectively during the 1990s, while 36 percent of residents in the more violent neighbourhoods were homeowners in the last decade of the century.

The relationship between neighbourhood homicide levels and proportion of black owner-occupied housing stands in marked contrast to that for total owner-occupied housing (see Figure 4.12). At each decade, there were significantly more black homeowners in neighbourhoods experiencing two or more homicide events compared to less violent neighbourhoods.<sup>42</sup> In the 1950s the percentage of black homeowners in

---

<sup>42</sup> Percent black owner-occupied housing is a variable that is dependent on the racial composition of neighbourhoods, in addition to home ownership rates. As such, in neighbourhoods without African

neighbourhoods with two or more incidents (2.8 percent black owner-occupied housing) was more than 90 times that of neighbourhoods with less homicide (0.03 percent and 0.4 percent black owner-occupied housing in neighbourhoods with zero and one homicide respectively). By the 1990s, very little had changed among neighbourhoods experiencing very low homicide counts (1.7 and 0.7 percent black owner-occupied housing in neighbourhoods with zero and one homicide respectively). However the proportion of African American homeowners in neighbourhoods experiencing two or more homicides increased to an average of 11 percent.

The vacancy rate in the city of Buffalo was extremely low in the 1950s, owing largely to the remnants of the economic boom during WWII and the return of veterans to the city. As shown in Figure 4.13, less than two percent of housing units were vacant, even in neighbourhoods with two or more homicides. However, a sharp divergence is evident in the decades that followed the 1950s; neighbourhoods with two or more homicides were characterized by a growing proportion of vacant housing units over time. By the 1990s, neighbourhoods with two or more homicides had, on average, 12 percent vacant housing, while neighbourhoods with zero and one homicide averaged seven and six percent respectively. The difference between those neighbourhoods with two or more homicides and those with fewer was statistically significant in each decade following the 1950s.

---

American residents, the level of black home ownership is constrained to be zero. For neighbourhoods with some proportion of the population identified as black, this variable is free to vary by home ownership opportunities (i.e. in the form of available housing) and desires of residents (i.e. to invest in home ownership in the neighbourhood). The relationship between black owner-occupied housing and neighbourhood homicide categories is, in part, driven by the racial composition of tracts (refer to Figure 4.4).

Finally, the neighbourhoods with two or more homicides were, as expected, less residentially stable.<sup>43</sup> Apart from the 1980s, on average the proportion of residents living in the same house for the previous five years was lower in neighbourhoods with two or more homicides compared to neighbourhoods with fewer homicides in each of the postwar decades (see Figure 4.14). By the 1990s, an average of 55 percent of residents were long-time inhabitants in neighbourhoods with two or more homicides compared to 63 and 62 percent of residents in neighbourhoods with zero and one homicide respectively.

Housing characteristics were on the whole quite good at distinguishing among neighbourhoods based on their homicide counts throughout the postwar era. Countervailing trends exist between total owner-occupied housing and black owner-occupied housing. That is, home ownership as a whole was lower in tracts that experienced two or more homicides, but black home ownership was higher in such neighbourhoods. Violent neighbourhoods also had more vacant housing and less residential stability from the 1960s through the 1990s.

#### **4.1.4 Summary**

To recap, the purpose of this section was to first assess the degree of stability in homicide across Buffalo neighbourhoods over the entire postwar period. Zero-order correlations between homicide counts (or rates) in one decade and homicide counts (or rates) in the following decade indicate a high degree of short-term stability in homicide within neighbourhoods. The size of these correlations, however, declined measurably as

---

<sup>43</sup> Recall that the measure of residential stability for the 1950s is not comparable to the measures in subsequent decades and is therefore omitted.

the time span between decades increased. These findings point to a changing pattern in the distribution of homicide across Buffalo's landscape.

Second, I introduced a useful if crude measurement strategy for distinguishing among neighbourhoods with different levels of violence: I categorized neighbourhoods according to the number of homicide incidents occurring in the decade (i.e., zero, one, and two or more). This analysis showed that homicide dispersed across an increasing number of neighbourhoods, particularly early in the period, suggesting some diffusion of violence. An examination of the specific diffusion process responsible for changes in the distribution of homicide across neighbourhoods in Buffalo is the subject of the next section (section 4.2).

Finally, the demographic, socioeconomic and housing characteristics of neighbourhoods were examined across tracts distinguished by their homicide counts. Longitudinal graphs for each of the neighbourhood characteristics illustrated very few differences between neighbourhoods with zero compared to one homicide. However, neighbourhoods with two or more homicides differed significantly from the other two neighbourhood categories on a number of key dimensions. Greater African American concentration, lower male labour force participation, higher poverty, lower owner-occupied housing, and more black owner-occupied housing differentiates neighbourhoods experiencing two or more homicides from other neighbourhoods throughout the postwar period. Yet, the extent to which other demographic, socioeconomic, and housing characteristics distinguished among neighbourhoods categorized by homicide counts varied across decades. This suggests the possibility of

some historical contingency in the ecological correlates of neighbourhood homicide levels, an issue I take up more fully in Chapter 5.

## 4.2 HOMICIDE IN NEIGHBOURHOODS ACROSS SPACE

The results I described earlier in this chapter suggest that there may have been some spatial diffusion of homicide across Buffalo neighbourhoods between the 1950s and the end of the century. The assumption underlying a spatial diffusion process is contagion, whereby contiguity of tracts or geographic exposure to nearby neighbourhoods is necessary for diffusion to occur.<sup>44</sup> In this section, I examine changes in the spatial distribution of homicide across Buffalo to determine whether the process of diffusion across neighbourhoods is typical of an *expansion* or a *relocation* diffusion of homicide (Cliff et al. 1981; Cohen and Tita 1999). *Expansion diffusion* would be implied if, as the overall rate of homicide grew over time, homicide emanated outward from the neighbourhoods with the highest levels of violence. For this type of diffusion, these violent neighbourhoods would themselves remain violent over time. By contrast, a *relocation diffusion* would be implied if homicide moved across the city such that neighbourhoods adjacent to neighbourhoods with high levels of homicide experienced higher counts and rates of homicide over time but the ‘point of origin’ neighbourhoods

---

<sup>44</sup> Cohen and Tita (1999) propose an alternative to contagious diffusion, called hierarchical diffusion. Hierarchical diffusion “...describes transmission through an ordered sequence of classes or places” (Cliff et al. 1981:9). According to Cohen and Tita (1999:455), hierarchical diffusion “...does not require direct contact but, rather, occurs through *spontaneous innovation* or *imitation*” (*emphasis* in the original). These authors suggest that hierarchical diffusion is most likely to occur through “broad cultural influences” such as the mass media, or through spontaneous innovation in geographically dispersed neighbourhoods, such as the development, manufacture, and sale of potent and cheap crack cocaine rocks. While processes of hierarchical diffusion are worthy of consideration, the foci of this study are on 1) the importance of geographic space as a measure of neighbourhood ‘exposure’ to violence and 2) the evidence for transmission of violence across geographically proximate neighbourhoods over half a century. As such, the current analysis focuses on evidence for contiguous diffusion in the form of either *expansion* or *relocation* diffusion.

cooled off. In this case, new and different neighbourhoods would assume the status of the most violent neighbourhoods in the city as time passed.

The remainder of this chapter will rely on Exploratory Spatial Data Analysis (ESDA) techniques to investigate *where* Buffalo's highly violent neighbourhoods were located, and *how* the spatial distribution of homicide changed over time. Given the previously described relationships between homicide and the demographic, socioeconomic and housing features of neighbourhoods, I also present maps of the distribution of these various characteristics by decade. This analysis allows me to investigate the possibility that the spatial arrangement of neighbourhoods, in addition to their internal characteristics, plays a role in producing within-neighbourhood homicide levels.<sup>45</sup>

#### **4.2.1 Spatial Patterns in the Geography of Homicide: Stability or Diffusion?**

I present three sets of maps to explore the spatial distribution of homicide in Buffalo between the 1950s and the 1990s: 1) point pattern maps, 2) Moran Scatterplot maps, and 3) maps representing the standard deviation of homicide rates.

The point pattern maps in Figure 4.15 illustrate homicide locations between January 1<sup>st</sup> 1950 and December 31<sup>st</sup> 1999 in ten-year intervals.<sup>46</sup> Absent from these maps are homicides in which information about location was missing or incomplete.<sup>47</sup> These

---

<sup>45</sup> Spatial regression analyses undertaken in Chapter 6 will examine the explanatory power of geographic proximity to violent neighbourhoods. In this chapter, I use exploratory mapping procedures to assess preliminary evidence of these patterns.

<sup>46</sup> This visual account of where homicide incidents are located across the city of Buffalo for 10-year periods from the 1950s through the 1990s is created with Arcview 3.2 software. The yellow tracts represent 'downtown' Buffalo.

<sup>47</sup> There were a total of 78 unmatched or missing homicide incident addresses in Buffalo after geocoding the data. Of the 2033 incidents in the data set, then, 3.84 percent were missing, leaving a total of 1955 valid cases. In total, 6 cases did not match on the Buffalo shapefile of legitimate addresses (5204, 6212,

point-pattern maps show that homicides in Buffalo were non-randomly distributed across the city, and that homicide indeed showed some evidence of diffusion across neighbourhoods over time.<sup>48</sup> While there is evidence of the clustering of homicide within a small group of neighbourhoods near the downtown core in the 1950s, a gradual shift in homicide incident locations across neighbourhoods is apparent over the long-term. This suggests that the diffusion of homicide in Buffalo took the form of *relocation diffusion* over the five decades, such that homicides were concentrated in the downtown core during the 1950s, spread north and east over the following decades, and were almost completely absent from the core by the 1990s (Griffiths 2004).

Two issues regarding point pattern maps require consideration. First, while point pattern maps provide some indication of the movement of violence over time and the clustering of homicide within census tracts, this analysis alone can not determine whether the observed clustering in space is statistically significant. Thus it is necessary to quantitatively assess whether any apparent clustering of the data presented in point pattern maps is statistically significant. These tests are performed by creating Moran Scatterplot maps described below.

Second, the movement of homicide locations from one neighbourhood to another does not necessarily prove that the most violent neighbourhoods in the city changed over time; that is, it does not provide a sense of the *relative* changes in the distribution of homicide over five decades. In other words, without information on the size of the residential population of these neighbourhoods, it is not clear whether changes in the

---

6833, 7149, 8912, and 9276), and an additional 15 cases were missing information on incident location in the 1950s, 10 cases in the 1960s, 23 cases in the 1970s, 19 cases in the 1980s, and 5 cases in the 1990s. The low proportion of cases missing location information suggests that any biases will be minimal.

<sup>48</sup> See Monmonier (1993) for the benefits of spatial-temporal series maps of change.



spatial distribution of homicide incidents shown in these maps represents any change in the rank ordering of neighbourhoods by homicide levels. In fact, the movement of the city's population toward the suburbs affected downtown neighbourhoods much more severely than neighbourhoods bordering suburbia. The downtown core depopulated by almost 80 percent between 1950 and 2000, from 45,094 in 1950 to 9,700 by 2000.<sup>49</sup> Mapping homicide rates, rather than incidents, at each decade would remedy this potential bias by taking into account the residential population at risk, and changes in the at-risk population over time. These, too, are provided below.

To assess significant spatial clustering of homicide across neighbourhoods, homicide incidents were converted to homicide rates at the tract level and spatial weights were computed to produce Moran Scatterplot maps.<sup>50</sup> These Moran Scatterplot maps illustrate whether homicide rates are distributed randomly across space. In other words, these maps tell us whether like values (i.e. tract homicide rates) cluster with like values (positive spatial autocorrelation), or whether different values cluster together (negative spatial autocorrelation) (Anselin et al. 2000; Messner et al. 1999). Two categories describe positive spatial association in the data: tracts that are above average in their homicide rate surrounded by neighbours that are also above average (labelled 'high-high'), and tracts that are below average surrounded by neighbouring tracts that are also below average (labelled 'low-low'). Negative spatial association is suggested when above average tracts have below average neighbours (labelled 'high-low'), and when below average tracts are surrounded by above average tracts (labelled 'low-high'). Maps

---

<sup>49</sup> The downtown core is identified as being comprised of tracts 13, 14, 25, and 72. These tracts are highlighted in yellow in Figure 4.15.

<sup>50</sup> SpaceStat 1.90 software was used to create spatial weights for the Moran Significance maps procedure in Arcview 3.2.

identifying these categories provide a general sense of the level of *citywide* spatial autocorrelation, and indicate whether it is positive or negative.

Using a linear extrapolation of the population in each census year, I calculated the homicide rate in each decade for each tract using the population at the *midpoint* of each decade as the denominator, and the total number of homicides in the tract for each decade as the numerator. This strategy reduces problems associated with the use of decennial census data in a city experiencing rapid decline in total population.<sup>51</sup>

The citywide spatial autocorrelation can be quantified by estimating a global measure of spatial autocorrelation, such as a Moran's I statistic. Like the Pearson correlation coefficient, the Moran's I is a cross-product coefficient that is widely used as a summary measure of spatial clustering (Anselin et al. 2000; Cliff and Ord 1973).

Figure 4.16 shows Moran Scatterplot maps of neighbourhood homicide rates at each decade between the 1950s and the 1990s. In each case the Global Moran's I statistic was positive and highly significant, which means that there was indeed a non-random clustering of homicide in Buffalo during each post WWII decade.

The Moran Scatterplot maps in Figure 4.16 suggest that high homicide rate tracts generally cluster with other high rate tracts and low rate tracts generally cluster with other low rate tracts across these five decades. This is not unexpected as research has

---

<sup>51</sup> An example of the potential error that can be introduced in using decennial census figures to calculate rates by tract in a city with a declining population is provided here. Tract 14 had 50 homicides within its boundaries between January 1<sup>st</sup> 1970 and December 31<sup>st</sup> 1979. The tract population in 1970 was 8,866 but this had dropped by more than half to 4,114 by 1980. Using the 1970 population as the denominator for the homicide rate over the 1970s in tract 14 would provide a rate of 5.64 homicides per 1,000  $((50/8866)*1000)$ . If we used the 1980 population denominator, we would calculate a rate of 12.15 homicides per 1,000 residents  $((50/4114)*1000)$ , more than twice the earlier rate. Instead I extrapolated a mid-point population estimate of approximately 6,490 in 1975 and used this as the denominator for calculating tract 14's 1970s rate. This leads to a homicide rate in the 1970s for tract 14 of 7.70 per 1,000  $((50/6490)*1000)$ . In this instance tract 14 lost a substantial proportion of its population over time, and thus serves as an extreme example. While other tracts may have experienced somewhat less severe depopulation, markedly skewed rates may result if the mid-point is not used as the denominator.

consistently found that crime and violence are concentrated in contiguous neighbourhoods. However the specific neighbourhoods included in both high and low homicide rate clusters do vary over the five decades. This suggests some *instability* in where homicide happens more generally, and illustrates the shifting distribution of homicide across the city over time.

The maps displayed in Figure 4.16 reveal that homicide moved out of the downtown core and toward the city's East Side, particularly after the 1970s. Between eight and 12 tracts were clustered together as 'high-high' (red) homicide rate neighbourhoods at each decade which suggests that violence was *relocating* and not simply *expanding* from a central location. The bivariate correlation coefficients provided in Table 4.4 describe these shifting homicide locales as proportionately more likely to occur downtown earlier in the period, followed by a movement away from the city center by the 1980s. In fact, these correlations show that homicides were much more likely to have occurred in downtown tracts in the 1950s, 1960s, and 1970s (as evidenced by a positive and significant zero-order correlation coefficient between homicide count with downtown<sup>52</sup> tracts), but by the 1980s the correlation lost significance, and by the 1990s the direction of the relationship had reversed. This provides further evidence of the spatial relocation of homicide from Buffalo's city center to other locales. Nevertheless neighbourhoods in both North and South Buffalo were characterized by a significant clustering of low homicide tracts between the 1950s and the 1990s. In other words, the relocation diffusion of homicide did not extend to these neighbourhoods.

Figure 4.17 provides the final sets of homicide maps for Buffalo over the postwar period. Again, these maps graphically illustrate the movement of homicide in the city.

---

<sup>52</sup> See fn. 49.

These maps convert tract homicide rates to standard deviation units in order to standardize comparisons across the five decades – a period during which the average homicide rate changed dramatically.<sup>53</sup>

In the 1950s, with the exception of one tract, all neighbourhoods with homicide rates above the mean (0.3 homicides per 1,000) were located in the downtown core and just south of downtown past the Buffalo River and into the Tiff Nature Preserve (see Figure 2.1 for a map delineating the physical geography of Buffalo). In the 1960s and even more so during the 1970s, high rate tracts were concentrated in the downtown core, with some evidence of slight *expansion diffusion* to the northeast of downtown into the Fruitbelt – a largely African American community that would later transform into an inner-city urban ghetto. By the 1980s, however, neighbourhoods with homicide rates that were three or more standard deviations above the mean (more than 5.8 homicides per 1,000 population) evidenced *relocation diffusion*, and were no longer in the heart of downtown or along the waterfront. Rather, the highest rate neighbourhoods were found much deeper into Buffalo's East Side. The map for the last decade of the twentieth century shows the continued relocation of homicide from the downtown core even further into the East Side. While these downtown neighbourhoods had homicide rates largely between the mean (1.7 homicides per 1,000 residents) and one standard deviation above the mean (3.6 per 1,000 population), the downtown core no longer contained the most violent neighbourhoods in the city by the end of the century.

---

<sup>53</sup> For instance, tracts with homicide rates falling three or more standard deviations above the mean in the 1950s had homicide rates of 2 to 3.7 per 1,000 population. By contrast, tracts with homicide rates falling three or more standard deviations above the mean in the 1990s had homicide rates of 7.3 to 8.2 per 1,000 population. Dividing tracts into standard deviations units that normalize by the mean and distribution of neighbourhood homicide rates in each decade is thus useful for comparative purposes across decades.

While these standard deviation maps, taken together with the point pattern maps and the Moran Scatterplot maps, provide evidence of *where* homicide was happening in Buffalo and *how* homicide moved over space, they cannot indicate what these shifts in the spatial distribution of homicide may have been either associated with or responding to. In the final section of this chapter, I provide descriptive maps of each of the demographic, socioeconomic, and housing characteristics to determine how neighbourhood characteristics cluster in space. Again, I use standard deviation categories of demographic, socioeconomic, and housing characteristics to allow for comparison over the five decades. This analysis is a first step in explaining why *relocation diffusion* of homicide occurred across neighbourhoods in Buffalo between 1950 and 1999.

#### **4.2.2 Spatial Patterns in the Geography of Demographic, Socioeconomic, and Housing Characteristics**

Poverty stricken neighbourhoods are often characterized by other markers of social and economic disadvantage including racial segregation, low male labour force participation, high levels of vacant and/or rental housing, and high rates of violence, forming what some call the urban ghetto (Hirsch 1983; Jencks and Peterson 1991; Wilson 1987). Jargowsky (1997) argues that many cities, including Buffalo, experienced ghetto expansion between the 1970s and the 1990s. Given that the 'urban ghetto' is likely comprised of a growing number of census tracts over time, and is generally characterized by social and economic disadvantages, the neighbourhood characteristics described in Chapter 3 should be distributed non-randomly across the city. The extent to which neighbourhood characteristics changed over time might help to explain the shifting spatial pattern, or the relocation, of homicide.

## DEMOGRAPHIC PATTERNS

Figure 4.18 displays five maps indicating the percentage of African American residents in neighbourhoods by standard deviation units for each decade.<sup>54</sup> During the 1950s, residential segregation of the black community into neighbourhoods in and around the downtown core and contiguous neighbourhoods (moving into the East Side) is evident. However, the vast majority of neighbourhoods in the city had proportions of African American residents below the citywide mean of 3.9 percent of the population. As the African American population grew it became increasingly concentrated first in the East Side's Ellicott district and later in both the Ellicott and Masten districts. This growth in the number of neighbourhoods inhabited by African Americans expanded toward the north-eastern edge of Buffalo between the 1950s and the 1990s. However, the neighbourhood with the highest proportion of African Americans during the 1950s was the same neighbourhood with the highest proportion of African Americans during the 1990s. Thus, while there was clearly a diffusion of the black community over a larger number of neighbourhoods between the 1950s and the 1990s, these changes are more consistent with an *expansion diffusion* process than with a *relocation diffusion* process.

Figure 4.19 shows a pattern of higher proportions of young residents living in South Buffalo from the 1950s through the 1990s, as well as in the Ellicott and the Masten districts from the 1970s onwards. Unlike South Buffalo neighbourhoods, those tracts in the Ellicott and Masten districts also were characterized by high proportions of African

---

<sup>54</sup> Recall that in order to make comparisons *across time* in the spatial distribution of any neighbourhood characteristic (e.g., homicide, poverty, labour force participation, etc.) it is necessary to standardize the measure at each decade. In essence, I am controlling for the mean at each decade which allows me to demonstrate the *relative* distribution across neighbourhoods for the *same decade* and then compare across decades, even though the mean may have changed dramatically. For each of the demographic, socioeconomic, and housing characteristics of neighbourhoods described in this section, I provide maps illustrating neighbourhoods at different standard deviation units from the citywide mean.

American residents (see Figure 4.18) and high homicide rates (see Figure 4.17) from the 1970s through the 1990s.

Finally, Figure 4.20 illustrates very little change in the geography of foreign born residents over the postwar era, independent of the fact that the citywide percentage of foreign born residents dropped dramatically across decades.<sup>55</sup> Nonetheless, higher proportions of the population were foreign born in the north-western neighbourhoods of Buffalo, while lower proportions of the population were foreign born in the East Side and the Masten districts over all periods, but particularly so from the 1970s through the end of the century (i.e., many of these neighbourhoods are between one and three standard deviations below the mean in later decades).

#### **SOCIOECONOMIC PATTERNS**

The four socioeconomic characteristics of Buffalo's neighbourhoods that I examine also show distinct patterns over time. According to the educational attainment maps in Figure 4.21, neighbourhoods in North Buffalo and in the far south-eastern regions of the city boasted higher than average levels of high school educational attainment, while the downtown core and a large portion of the East Side and Lower West Side experienced lower than average high school leaving (generally two to three or more standard deviation units below the mean). These patterns were relatively consistent over time.

The geographic distribution of male labour force participation also remained fairly consistent between the 1950s and the 1990s in the downtown core (with lower than average male labour force participation) (see Figure 4.22). However, by the 1990s more

---

<sup>55</sup> Recall from Table 3.1 (in Chapter 3) that the mean for percent foreign born in 1950 was 11.9 percent of the neighbourhood population, increasing three-fold to 35.8 percent in 1960, before falling to 7.6 percent in 1970, 6 percent in 1980, and 4.2 percent in 1990.

of the East Side and the Masten districts fell below the citywide mean of 64.9 percent of males in the labour force compared to earlier decades. That is, an increasingly larger share of neighbourhoods on the East Side experienced below average proportions of men in the labour force by the end of the period. While somewhat less dramatic, a similar pattern unfolds when comparing neighbourhoods by proportion of female labour force participation over the five decades (see Figure 4.23). A growing share of neighbourhoods from the downtown to the East Side, and toward South Buffalo, had lower than average female labour force participation over time.

Neighbourhoods with higher than average proportions of residents living in poverty clustered together throughout the period under study, but some diffusion of this cluster is apparent over the postwar period (see Figure 4.24). In the 1950s, more than 50 percent of the population in two of the four downtown neighbourhoods was living below the official poverty line. In addition, neighbourhoods on the Lower West Side and in the north-western section of the city (apart from the neighbourhoods to the far north of Buffalo) had poverty levels higher than the citywide average of 31.2 percent. By 1960, the number of tracts with poverty levels between the mean (16.4 percent) and two standard deviations above the mean (35.1 percent) declined. However, concentrated poverty simultaneously increased; in other words, more neighbourhoods could be described as two or more standard deviations above the mean citywide poverty level during the 1960s (these downtown and Ellicott district neighbourhoods ranged from 35.1 percent to 50 percent below the poverty line).

The process of diffusion of poverty across Buffalo neighbourhoods on the East Side and into the Masten district over time is one of *expansion diffusion*, with the



downtown core remaining economically deprived throughout the period. Beginning in the 1980s and extending into the 1990s, neighbourhoods on the edge of the city bordering the suburbs experienced relatively less poverty compared to the citywide mean of 20.5 percent in the 1980s and 26.2 percent in the 1990s. Thus, a stark contrast in spatial economic inequality among neighbourhoods in Buffalo emerged as the century drew to a close.

### **HOUSING PATTERNS**

The remaining four characteristics of neighbourhoods that I examine relate to the spatial distribution of housing features. According to Figure 4.25, very little change in the relative percentage of owner-occupied housing occurred in neighbourhoods in Buffalo over the five decades. Tracts in the downtown core had levels of owner-occupied housing between one and three standard deviations below the mean in each decade. The neighbourhoods surrounding downtown tended also to have lower than average home ownership rates, between the mean and one standard deviation below the mean. In neighbourhoods at the edge of the city, levels of owner-occupied housing were higher in each of the five decades under consideration, with some growth in owner-occupied housing occurring in South Buffalo relative to the mean for the 1980s and 1990s.

The standard deviation maps for black home ownership in Buffalo are instructive (see Figure 4.26). During the 1950s and 1960s, higher than average proportions of black homeowners lived in neighbourhoods just east of the downtown core – primarily in the Fruitbelt, but also through parts of the Masten district. However, this pattern changed markedly by the 1970s. At that point, the average proportion of black homeowners in

neighbourhoods on the East Side declined.<sup>56</sup> By contrast, in neighbourhoods on the edge of the city to the north, east, and south, the proportion of black homeowners was higher than average from the 1970s onward. This pattern is consistent with the findings of Patillo-McCoy (1999) in her study of black middle-class neighbourhoods in Chicago. That is, the more economically advantaged of the African American population tend to reside in the neighbourhoods bordering inner-city ghettos. So while a greater share of the black population in Buffalo lived directly in the centre of the East Side, those who lived in neighbourhoods just outside the most depressed neighbourhoods were more likely to own their own homes.

The spatial patterning of vacant housing is shown in Figure 4.27. The downtown and East Side neighbourhoods in Buffalo tended to have relatively higher proportions of vacant housing units from the 1960s through the 1990s, and to a lesser extent during the 1950s as well. The pattern for vacant housing exhibits an *expansion diffusion* across Buffalo neighbourhoods over time.

Finally, the spatial patterning of residential stability in Buffalo demonstrates more variability across the city in all decades compared to the patterns found for the other housing characteristics (see Figure 4.28). Higher than average proportions of residentially stable residents were located in South Buffalo and on the eastern border of the city between the 1960s and the 1990s, as well as in various neighbourhoods on the East Side and in North Buffalo. By contrast, the Lower West Side had lower than average levels of residential stability during each of the five decades under examination.

---

<sup>56</sup> Recall from Chapter 2 that the East Side experienced large-scale public housing construction between the late 1950s and the early 1970s.

### 4.2.3 Comparing the Spatial Patterning of Demographic, Socioeconomic, and Housing Characteristics with the Spatial Patterning of Homicide

In this section, I compare the relocation diffusion of homicide apparent in Figure 4.17 with the demographic, socioeconomic, and housing patterns described in Figures 4.18 to 4.28 over five decades in Buffalo. For demographic characteristics, there were changes in the spatial distribution of percentage African American residents, percentage foreign born residents, and percent young over time across neighbourhoods. The African American population experienced *expansion diffusion* outward from a central location near downtown farther into the East Side at the same time as homicide relocated from the downtown core to the East Side. Young residents comprised more of the population in neighbourhoods that had higher homicide rates (those in the Ellicott and the Masten districts) but also in South Buffalo neighbourhoods that had lower homicide rates over time. Consistent over the entire period, lower proportions of foreign born residents lived in neighbourhoods that experienced higher than average levels of homicide.

The socioeconomic characteristics of neighbourhoods in Buffalo showed relatively lower levels of educational attainment, male labour force participation, and female labour force participation, as well as relatively higher levels of poverty in neighbourhoods located downtown and into the East Side. Those same neighbourhoods also showed evidence of higher rates of homicide (refer to Figure 4.17). While the maps of neighbourhood socioeconomic characteristics demonstrate that each of the measures of socioeconomic disadvantage diffused across the city, the process of diffusion for socioeconomic characteristics appears to be one of *expansion diffusion*, rather than the *relocation diffusion* observed for homicide.

Finally, the geographic patterning of housing characteristics across Buffalo neighbourhoods, and over time, show that neighbourhoods with relatively lower proportions of owner-occupied housing and higher proportions of vacant housing also exhibited higher levels of homicide (refer to Figure 4.17). The spatial patterning of vacant housing in Buffalo overlaps with the spatial patterning of homicide, particularly on the East Side and the Lower West Side (refer to Figure 4.17). Black owner-occupied housing is proportionately more common in these neighbourhoods during the 1950s and 1960s before the pattern reversed in the 1970s and black homeowners become relatively less common in higher rate neighbourhoods. More varied patterns in residential stability are evident between the 1960s and the 1990s, save for the lower levels of residential stability on the Lower West Side, a predominantly immigrant Latino community. Importantly, the Lower West Side was also an area of Buffalo experiencing higher than average homicide rates over time.

#### **4.2.4 Summary**

The purpose of this section was to determine whether the spread of homicide to a greater number of postwar Buffalo neighbourhoods was caused by an *expansion diffusion*, wherein homicide spread from a few violent neighbourhoods that themselves maintained high homicide rates over time, or as a *relocation diffusion* where homicide moves outward leaving the initial core to ‘cool off.’ In this exploratory analysis, I found more evidence for the *relocation* process. That is, the most violent neighbourhoods early in the period (those in the downtown core) were not the most violent neighbourhoods from the 1970s onward. In fact, downtown neighbourhoods could be described as reasonably safe by the end of the period. However, violent neighbourhoods did not

spring up across the city in a random fashion. Instead, homicide in Buffalo slowly diffused from the city centre to the East Side in a non-random spatial relocation pattern.

To explore whether this movement of homicide could have coincided with changes in the demographic, socioeconomic and housing characteristics of contiguous neighbourhoods, I mapped these characteristics, and then compared them to the temporal and spatial distribution of homicide. These maps generally portrayed changing neighbourhood characteristics in the direction expected, given the strong associations between social and economic disadvantage and homicide identified in Chapter 3. Visually overlaying the standard deviation maps of the independent variables with standard deviation maps of homicide rates suggests that neighbourhoods with higher rates of homicide housed a greater proportion of African American residents, had relatively lower proportions of male labour force participation, manifested relatively higher poverty rates, displayed relatively lower total (and in the most violent areas during the later decades of the century, lower black) home ownership, and exhibited relatively higher proportions of vacant housing units compared to other neighbourhoods in the city. In all, this overlap suggests that compounded social and economic disadvantage was evident in neighbourhoods experiencing relatively higher homicide rates for the entire postwar period, but especially after the 1970s. In Chapter 6, I statistically examine the relationships between these demographic, socioeconomic, and housing-related characteristics in multivariate analyses predicting neighbourhood homicide rates.

### 4.3 CONCLUSION

At the start of this chapter, I outlined three questions that the analyses presented above were intended to address. First, I explored whether there was stability in the neighbourhoods that could be considered the most violent over five decades. My results showed that, in Buffalo, homicide affected a larger number of neighbourhoods by the end of the period than it did in the 1950s. These findings suggested that the spatial distribution of homicide changed in Buffalo over time. Additionally, I demonstrated that the process underlying this spatial redistribution of homicide was one of *relocation diffusion*, rather than *expansion diffusion*. These results confirm that there is *instability* in the spatial patterning of violence across neighbourhoods in Buffalo between the 1950s and the 1990s. This instability in the spatial distribution of homicide is only evident, however, when the scope of the analysis is extended over this larger time frame.

In the final section of this chapter, I examined the extent to which changes in the distribution of demographic, socioeconomic, and housing-related characteristics coincided with the changing spatial distribution of homicide across Buffalo neighbourhoods. These analyses demonstrated both an historical invariance *and* an historical contingency in the degree to which the neighbourhood correlates of homicide paralleled geographic patterns in homicide. The underlying assumption of an historical invariance argument is that the *same* demographic, socioeconomic and housing characteristics should influence neighbourhood crime rates in similar ways over time. The results of this chapter show that indeed some traditional neighbourhood correlates of crime appear to be consistently related to homicide counts and rates; and moreover, that changes in their spatial distribution coincided with changes in the spatial distribution of

homicide, at least partially. Yet other neighbourhood characteristics were not uniformly associated with neighbourhood homicide over a 50-year time frame. In Chapter 5, I take up this issue further and examine the extent to which demographic, socioeconomic, and housing characteristics of neighbourhoods in Buffalo exhibit historically invariant or historically contingent relationships with one another over the period under study.

**TABLE 4.1: Zero-Order Correlation Coefficients between the Counts of Homicides in Neighbourhoods across Census Decades, Buffalo, 1950s to 1990s**

Continuous		Homicide Count 1950s	Homicide Count 1960s	Homicide Count 1970s	Homicide Count 1980s	Homicide Count 1990s
Homicide Count 1950s	Pearson Correlation Sig. (2-tailed) N	1 . 72				
Homicide Count 1960s	Pearson Correlation Sig. (2-tailed) N	<b>.828(**)</b> .000 72	1 .			
Homicide Count 1970s	Pearson Correlation Sig. (2-tailed) N	<b>.597(**)</b> .000 72	<b>.799(**)</b> .000 72	1 .		
Homicide Count 1980s	Pearson Correlation Sig. (2-tailed) N	.227 .055 72	<b>.504(**)</b> .000 72	<b>.807(**)</b> .000 72	1 .	
Homicide Count 1990s	Pearson Correlation Sig. (2-tailed) N	.070 .561 72	<b>.271(*)</b> .021 72	<b>.670(**)</b> .000 72	<b>.869(**)</b> .000 72	1 . 72

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

**TABLE 4.2: Zero-Order Correlation Coefficients between the Rate<sup>†</sup> of Homicide in Neighbourhoods across Census Decades, Buffalo, 1950s to 1990s**

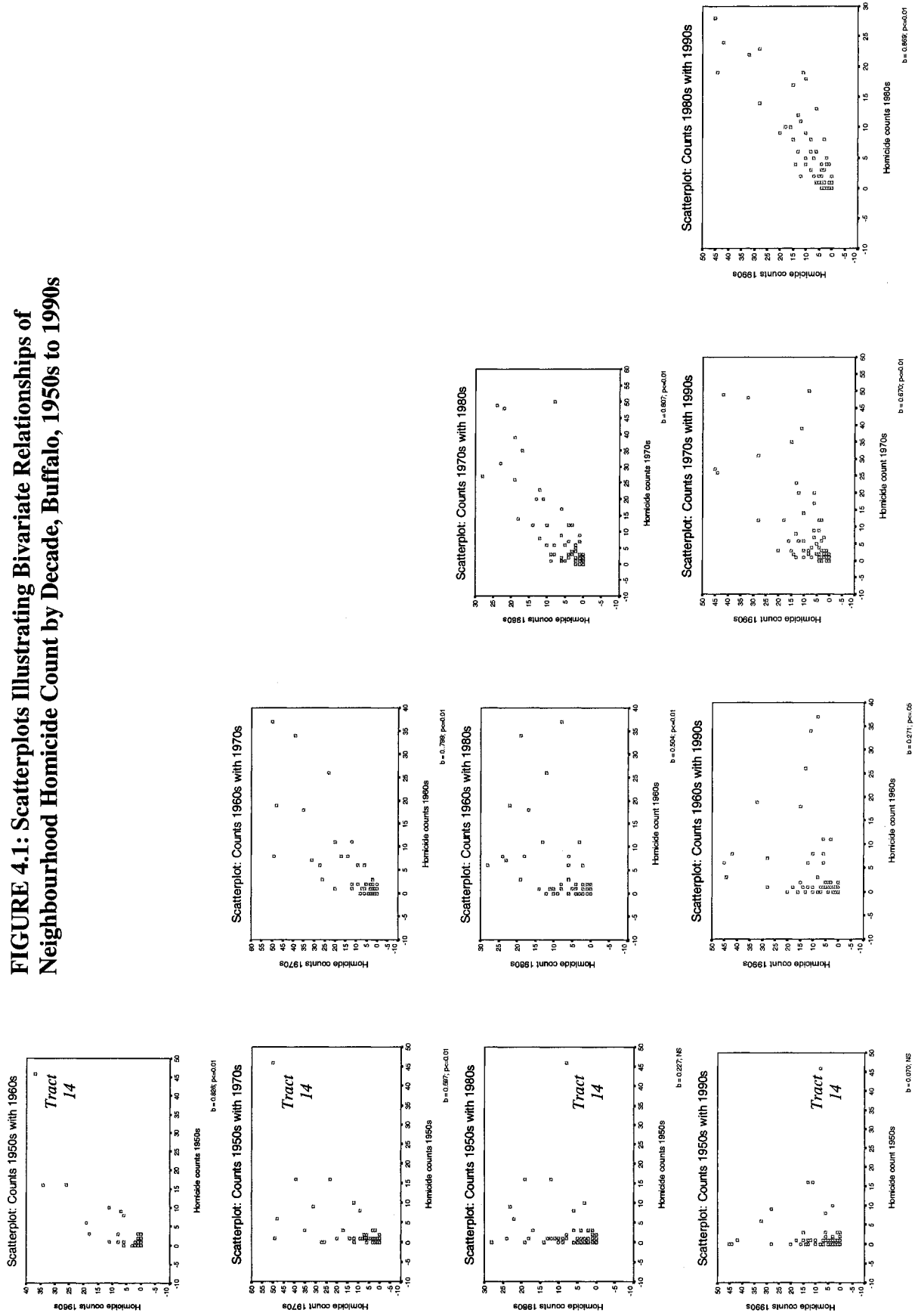
Rate		Homicide Rate 1950s	Homicide Rate 1960s	Homicide Rate 1970s	Homicide Rate 1980s	Homicide Rate 1990s
Homicide Rate 1950s	Pearson Correlation Sig. (2-tailed) N	1 . 72				
Homicide Rate 1960s	Pearson Correlation Sig. (2-tailed) N	<b>.689(**)</b> .000 72	1 .			
Homicide Rate 1970s	Pearson Correlation Sig. (2-tailed) N	<b>.567(**)</b> .000 72	<b>.861(**)</b> .000 72	1 .		
Homicide Rate 1980s	Pearson Correlation Sig. (2-tailed) N	<b>.305(**)</b> .009 72	<b>.684(**)</b> .000 72	<b>.806(**)</b> .000 72	1 .	
Homicide Rate 1990s	Pearson Correlation Sig. (2-tailed) N	.102 .393 72	<b>.406(**)</b> .000 72	<b>.591(**)</b> .000 72	<b>.724(**)</b> .000 72	1 . 72

\*\* Correlation is significant at the 0.01 level (2-tailed).

† Rate refers to number of homicides in the decade divided by the population at the mid-point of the decade (per 1,000 population)



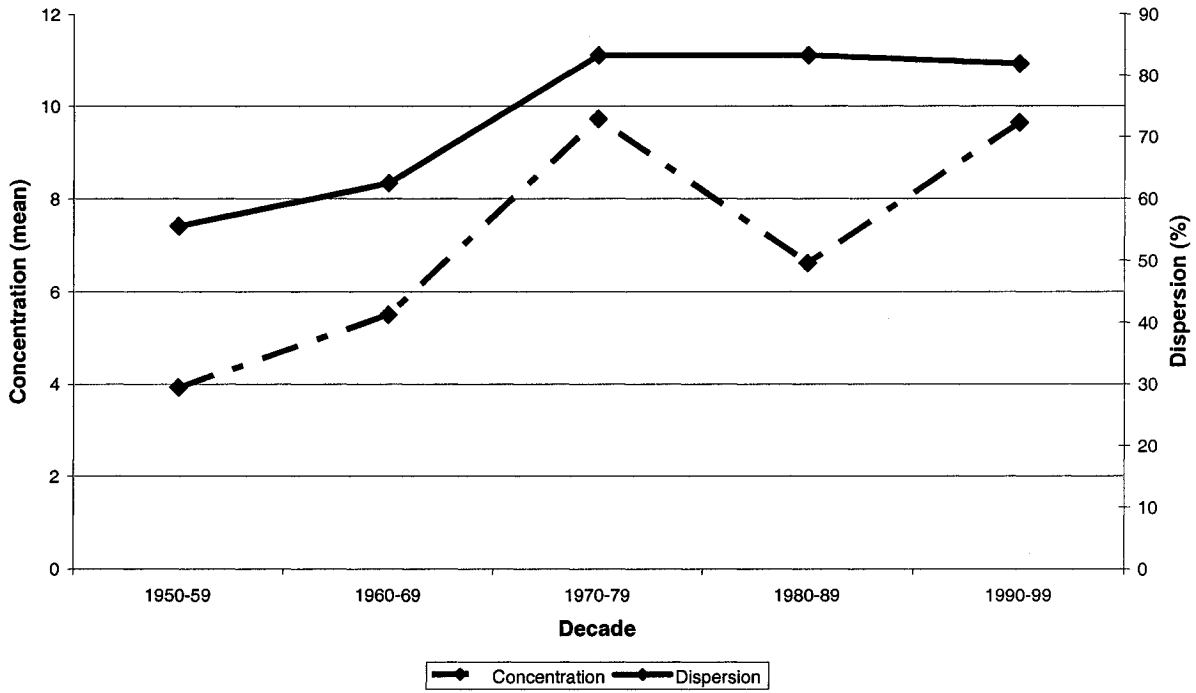
**FIGURE 4.1: Scatterplots Illustrating Bivariate Relationships of Neighbourhood Homicide Count by Decade, Buffalo, 1950s to 1990s**



**TABLE 4.3: Frequencies of Tracts with Zero, One, and Two or More Homicide Incidents by Decade, Buffalo (N=72)**

Homicide Count in Tract	1950s		1960s		1970s		1980s		1990s	
	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
<b>Zero</b>	32	44.4	27	37.5	12	16.7	12	16.7	13	18.1
<b>One</b>	25	34.7	21	29.2	10	13.9	15	20.8	8	11.1
<b>Two or more</b>	15	20.8	24	33.3	50	69.4	45	62.5	51	70.8
Mean	2.18		3.44		8.11		5.51		7.90	
(S.D.)	(6.108)		(7.213)		(12.235)		(6.743)		(10.248)	
Range	0-46		0-37		0-50		0-28		0-45	

**FIGURE 4.2: Concentration and Dispersion in Homicide across Neighbourhoods in Buffalo, 1950s through 1990s**



**FIGURE 4.3: Average Homicide Rate and Count in Buffalo Neighbourhoods, 1950s to 1990s**

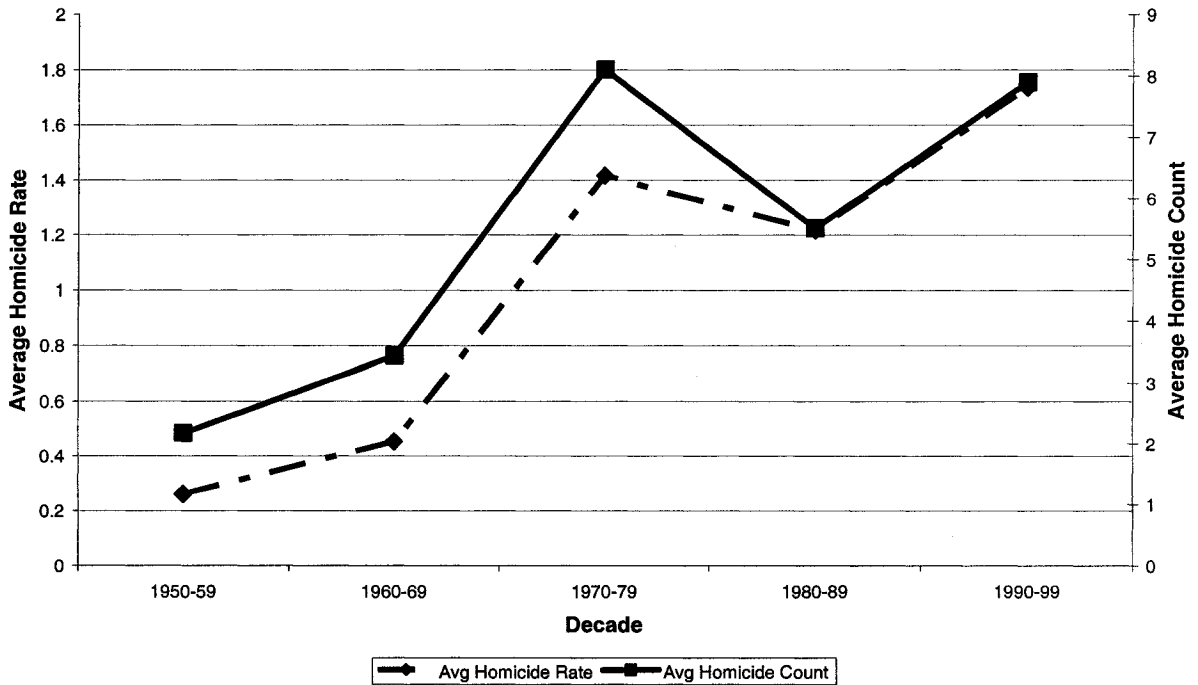
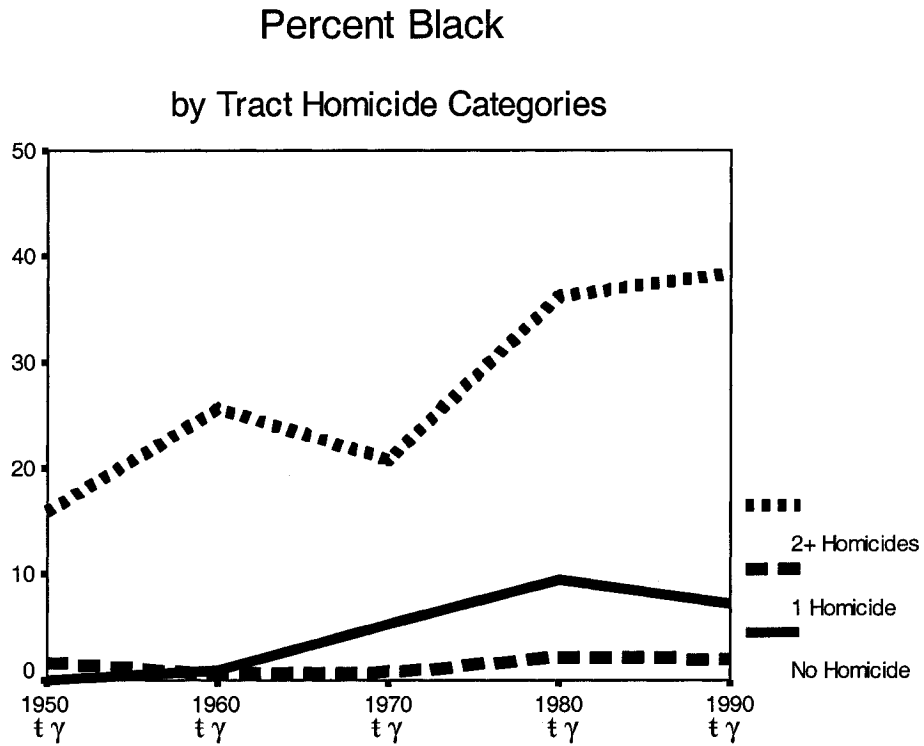


FIGURE 4.4:



*Legend for Figures 4.2 through 4.12: Independent Samples T-Tests conducted between: 1) 0 versus 1 homicide [\*  $p <= 0.05$ ], 2) 1 versus 2 or more homicides [ $\dagger p <= 0.05$ ], and 3) 0 versus 2 or more homicides [ $\gamma p <= 0.05$ ], equal variances not assumed*

FIGURE 4.5:

### Percent Young Population

by Tract Homicide Categories

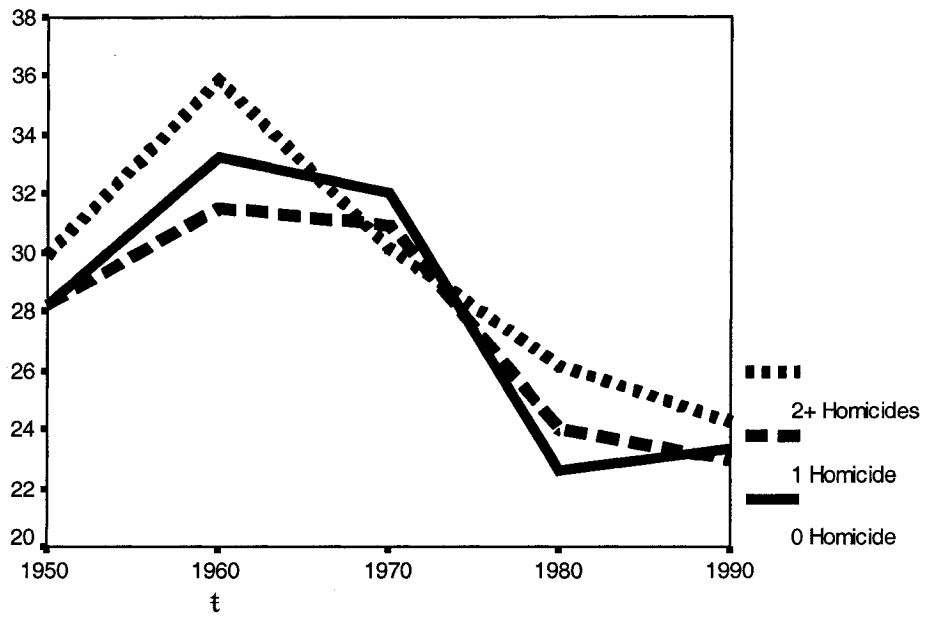


FIGURE 4.6:

### Percent Foreign Born

by Tract Homicide Categories

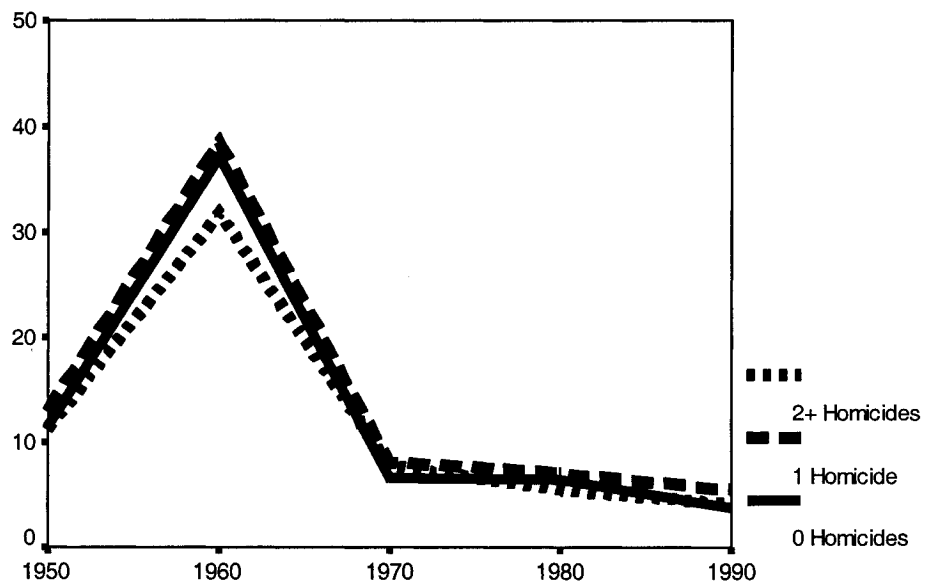


FIGURE 4.7:

Percent High School Attainment  
by Tract Homicide Categories

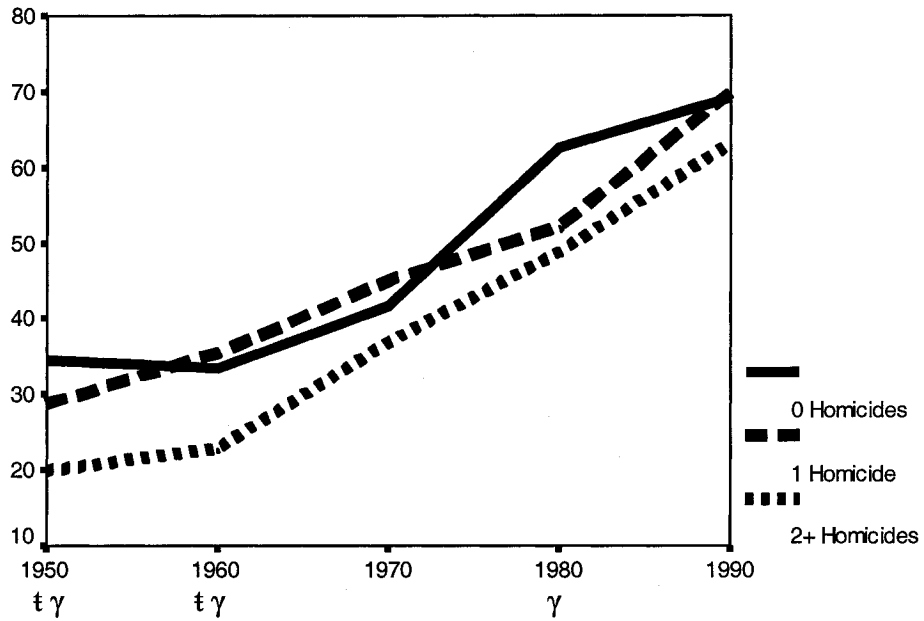


FIGURE 4.8:

Percent of Males in Labour Force  
by Tract Homicide Categories

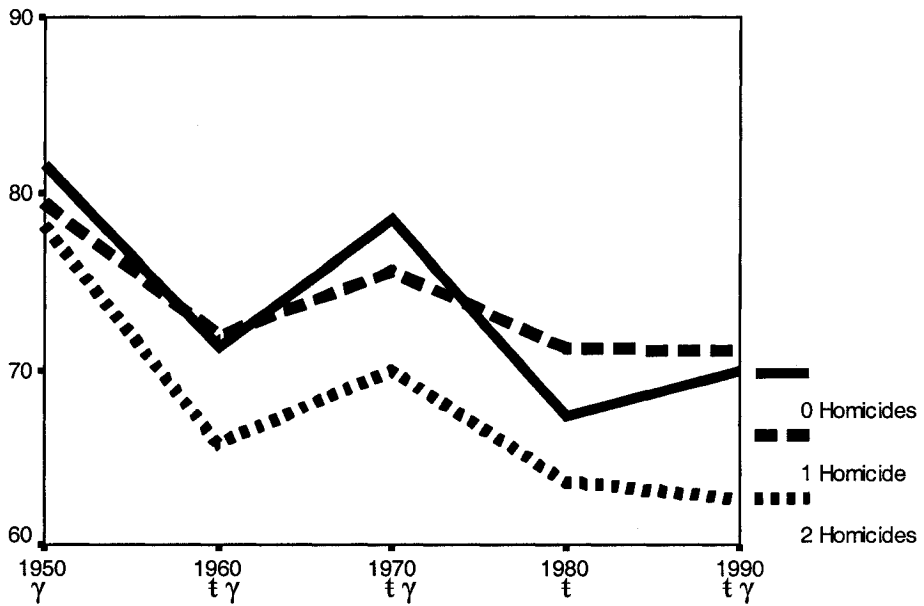


FIGURE 4.9:

Percent of Females in Labour Force  
by Tract Homicide Categories

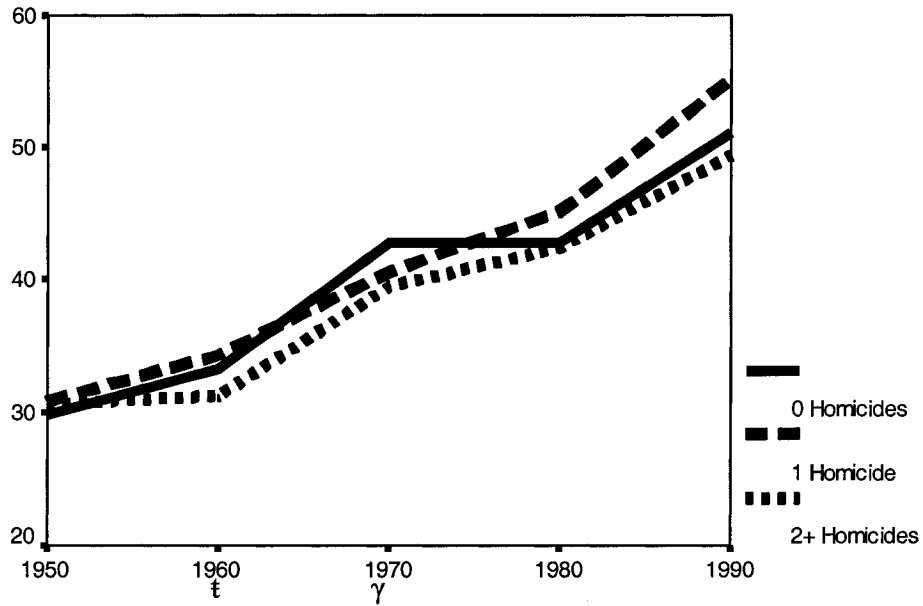


FIGURE 4.10:

Percent in Poverty  
by Tract Homicide Categories

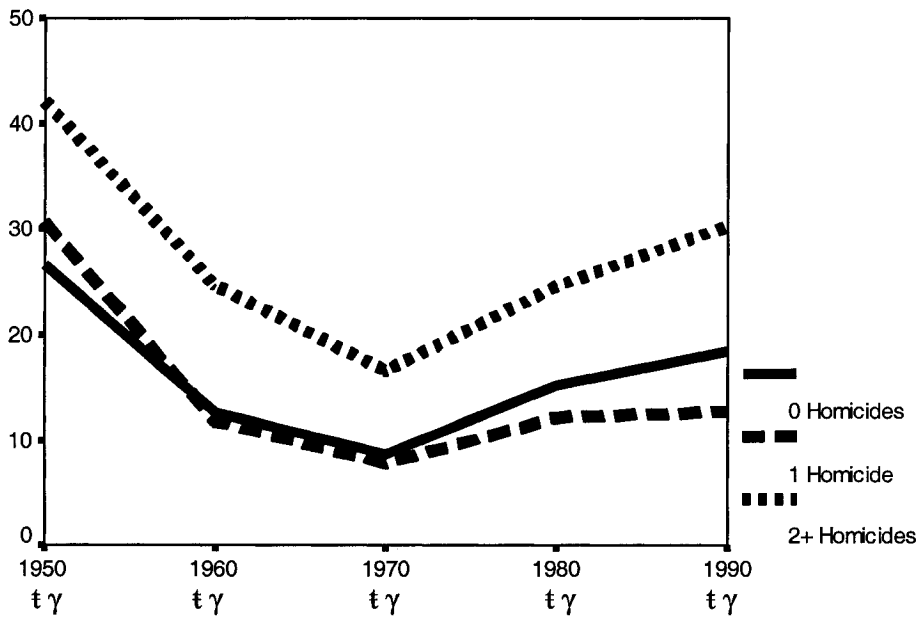


FIGURE 4.11:

Percent Owner Occupied Housing  
by Tract Homicide Categories

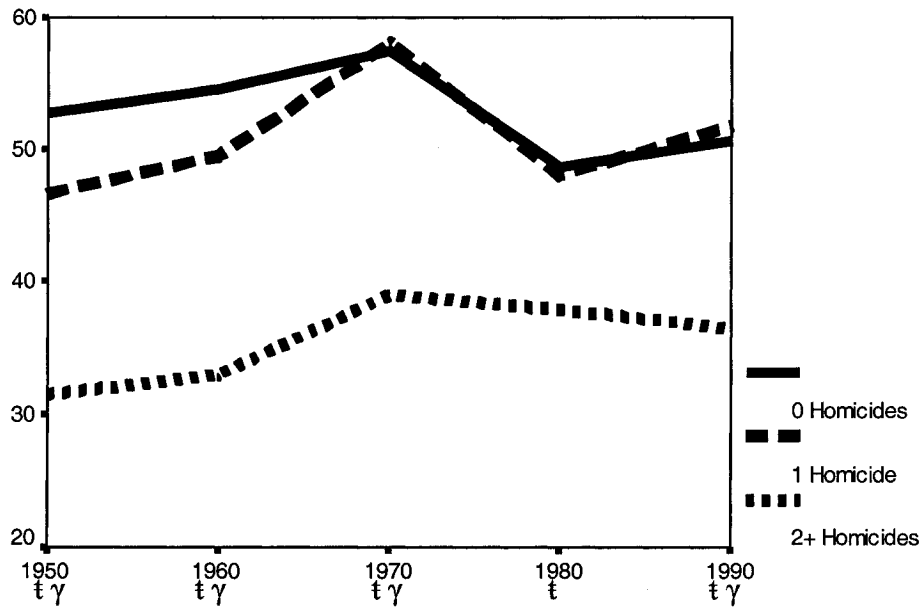


FIGURE 4.12:

Percent Black Owner Occupied  
Housing  
by Tract Homicide Categories

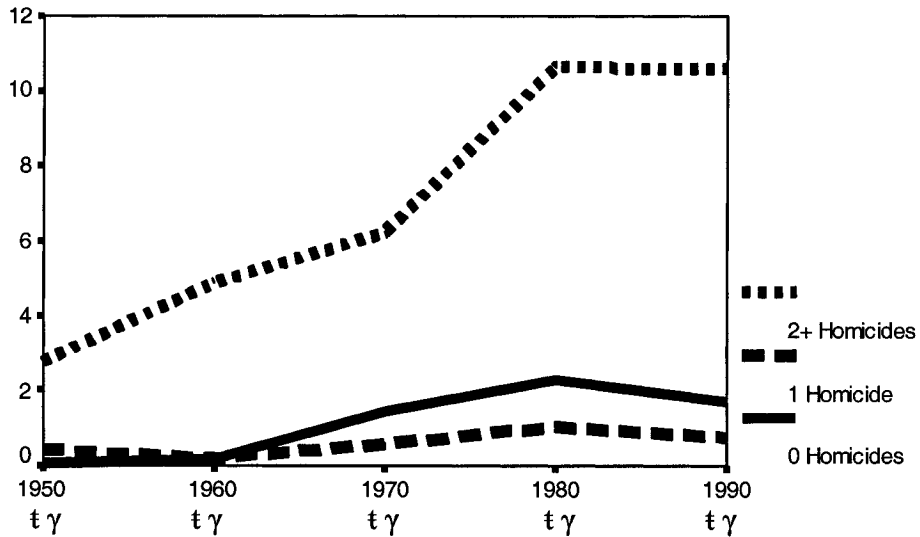




FIGURE 4.13:

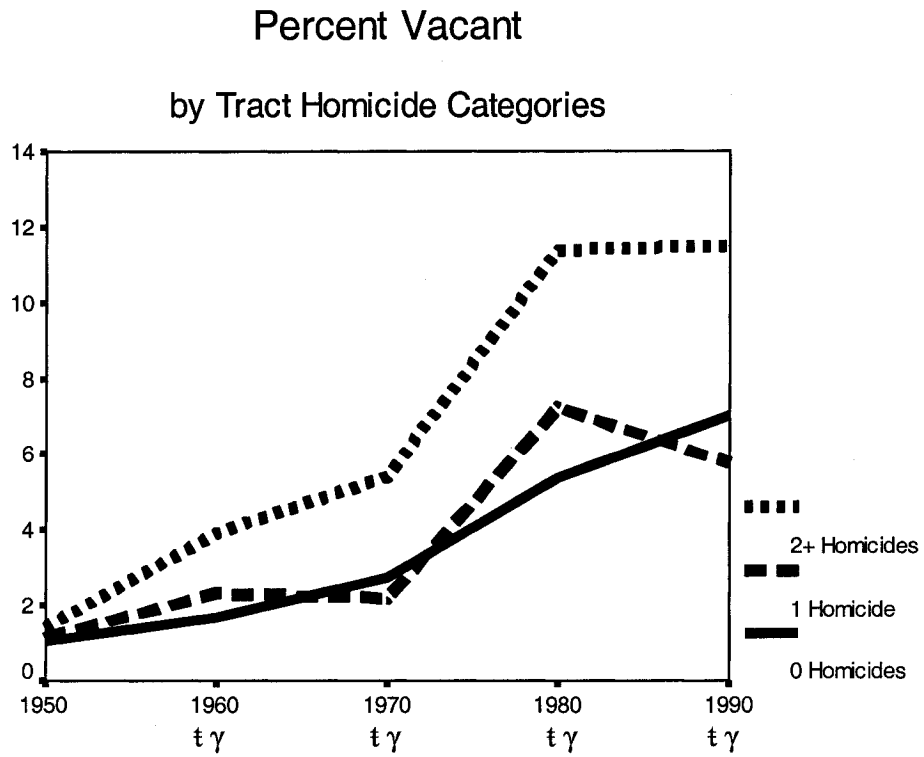
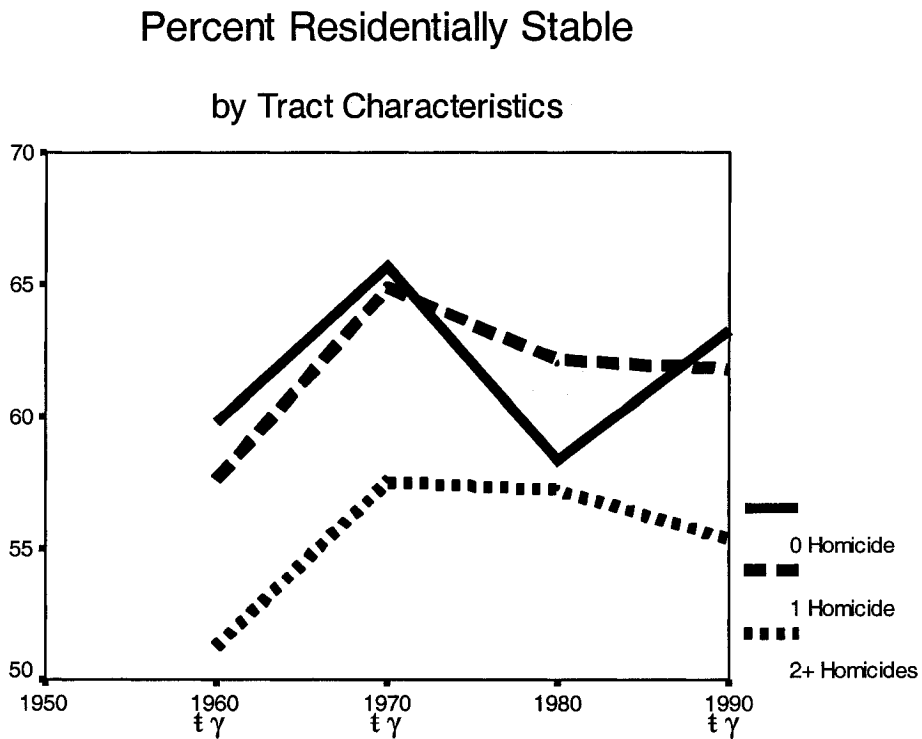
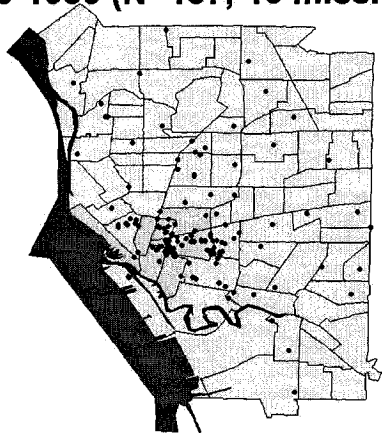


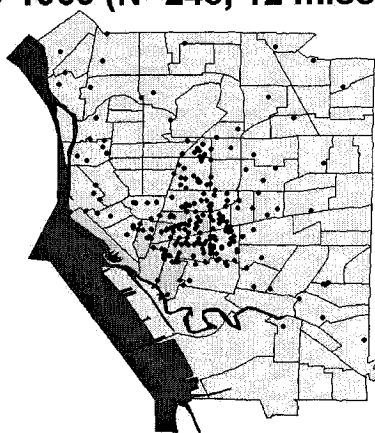
FIGURE 4.14:



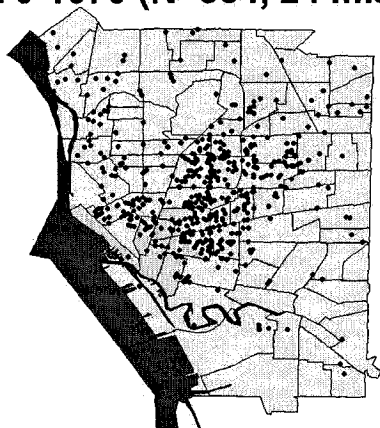
**Buffalo Homicide Incidents,  
1950-1959 (N=157, 16 missing)**



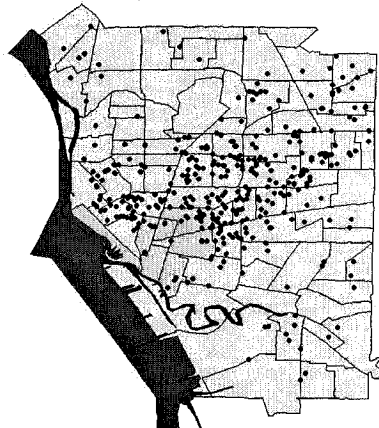
**Buffalo Homicide Incidents,  
1960-1969 (N=248, 12 missing)**



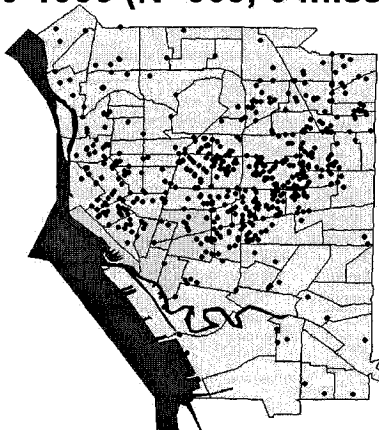
**Buffalo Homicide Incidents,  
1970-1979 (N=584, 24 missing)**



**Buffalo Homicide Incidents,  
1980-1989 (N=397, 20 missing)**

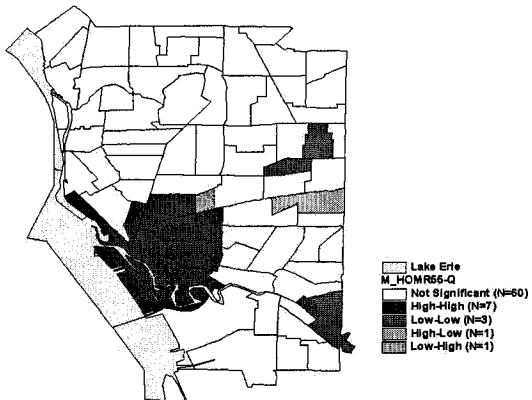


**Buffalo Homicide Incidents,  
1990-1999 (N=569, 6 missing)**



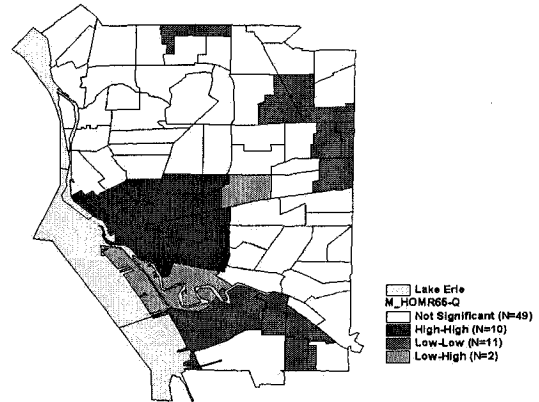
**FIGURE 4.15: Point Pattern Maps of Homicide Incidents in Buffalo, 1950s through 1990s**

**Moran - Homicide Rate 1950s**



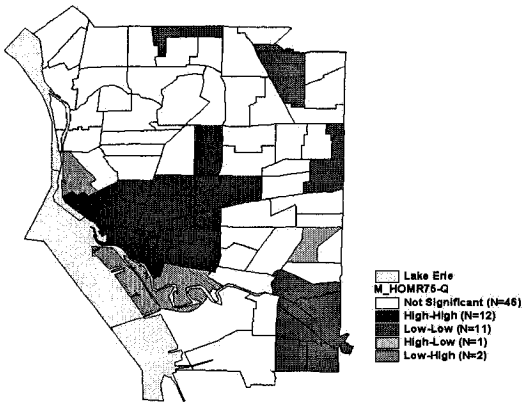
*Global Moran's I = 0.295\**

**Moran - Homicide Rate 1960s**



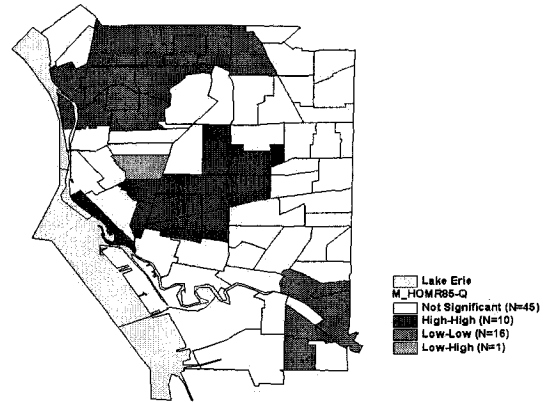
*Global Moran's I = 0.611\**

**Moran - Homicide Rate 1970s**



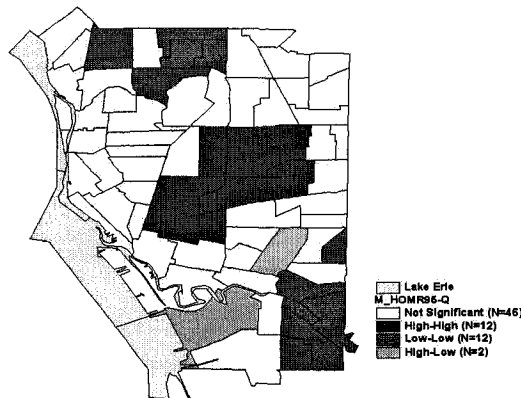
*Global Moran's I = 0.588\**

**Moran - Homicide Rate 1980s**



*Global Moran's I = 0.533\**

**Moran - Homicide Rate 1990s**



*Global Moran's I = 0.508\**

*\* p <= 0.001*

**FIGURE 4.16: Moran Scatterplot Maps of Buffalo Homicide Rates, 1950s through 1990s**

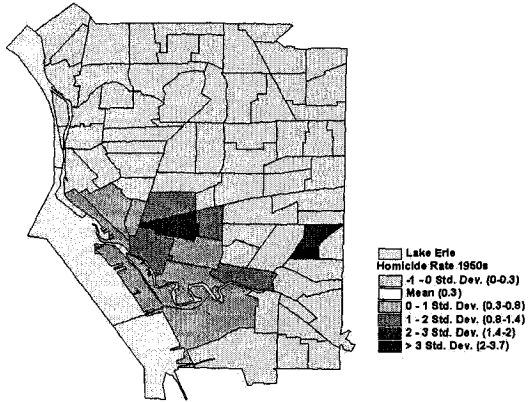
**TABLE 4.4: Zero-Order Correlation Coefficients for Tract Homicide Counts by  
Downtown Location**

	Occurred in a Downtown Tract <sup>1</sup>
Homicide Count 1950s	.663**
Homicide Count 1960s	.645**
Homicide Count 1970s	.427**
Homicide Count 1980s	.126
Homicide Count 1990s	-.022

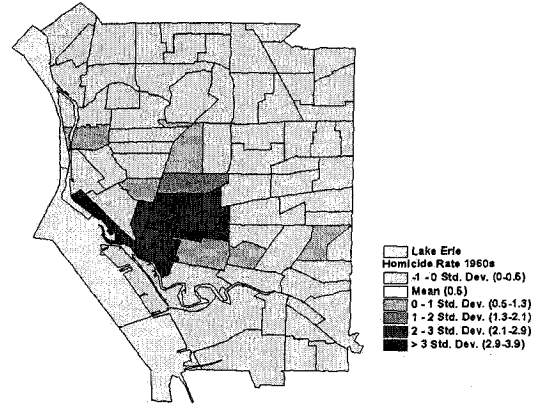
\*\* p<=.01

<sup>1</sup> Tracts 13, 14, 25, and 72 comprise downtown

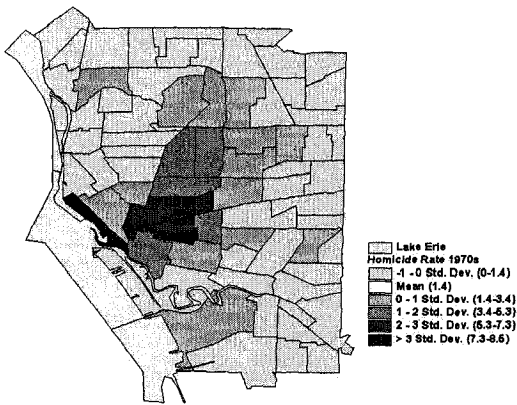
### Homicide Rate 1950s



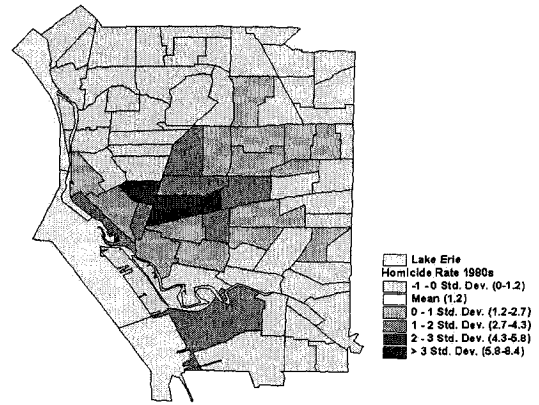
### Homicide Rate 1960s



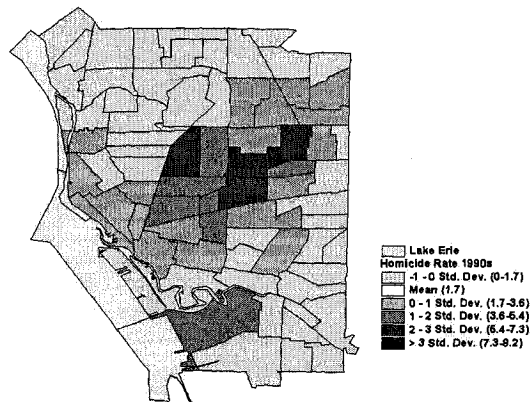
### Homicide Rate 1970s



### Homicide Rate 1980s

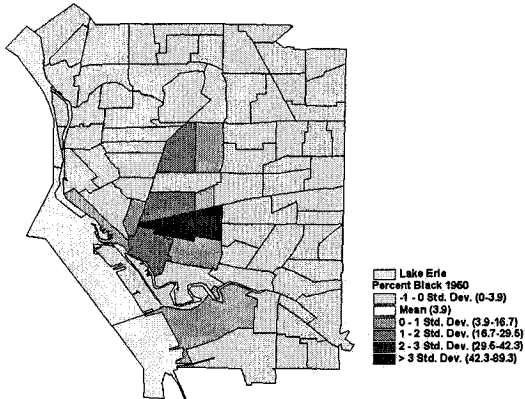


### Homicide Rate 1990s

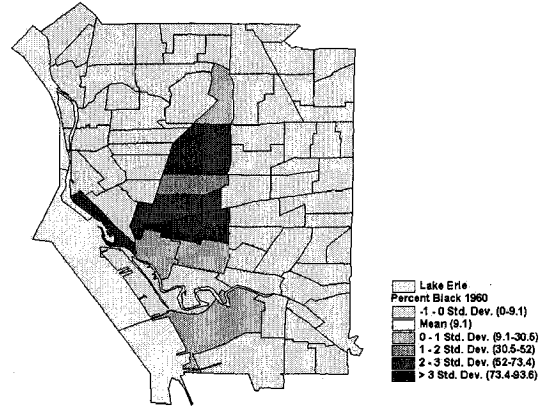


**FIGURE 4.17: Homicide Rate in Tract in Standard Deviation Units for Buffalo, 1950s through 1990s**

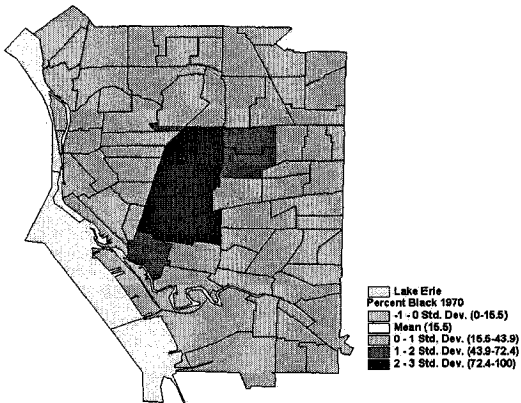
**Percent Black 1950**



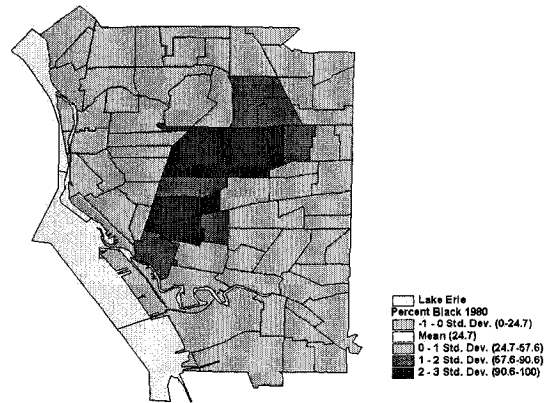
**Percent Black 1960**



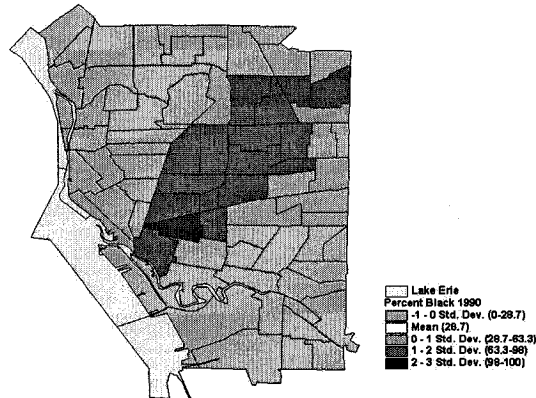
**Percent Black 1970**



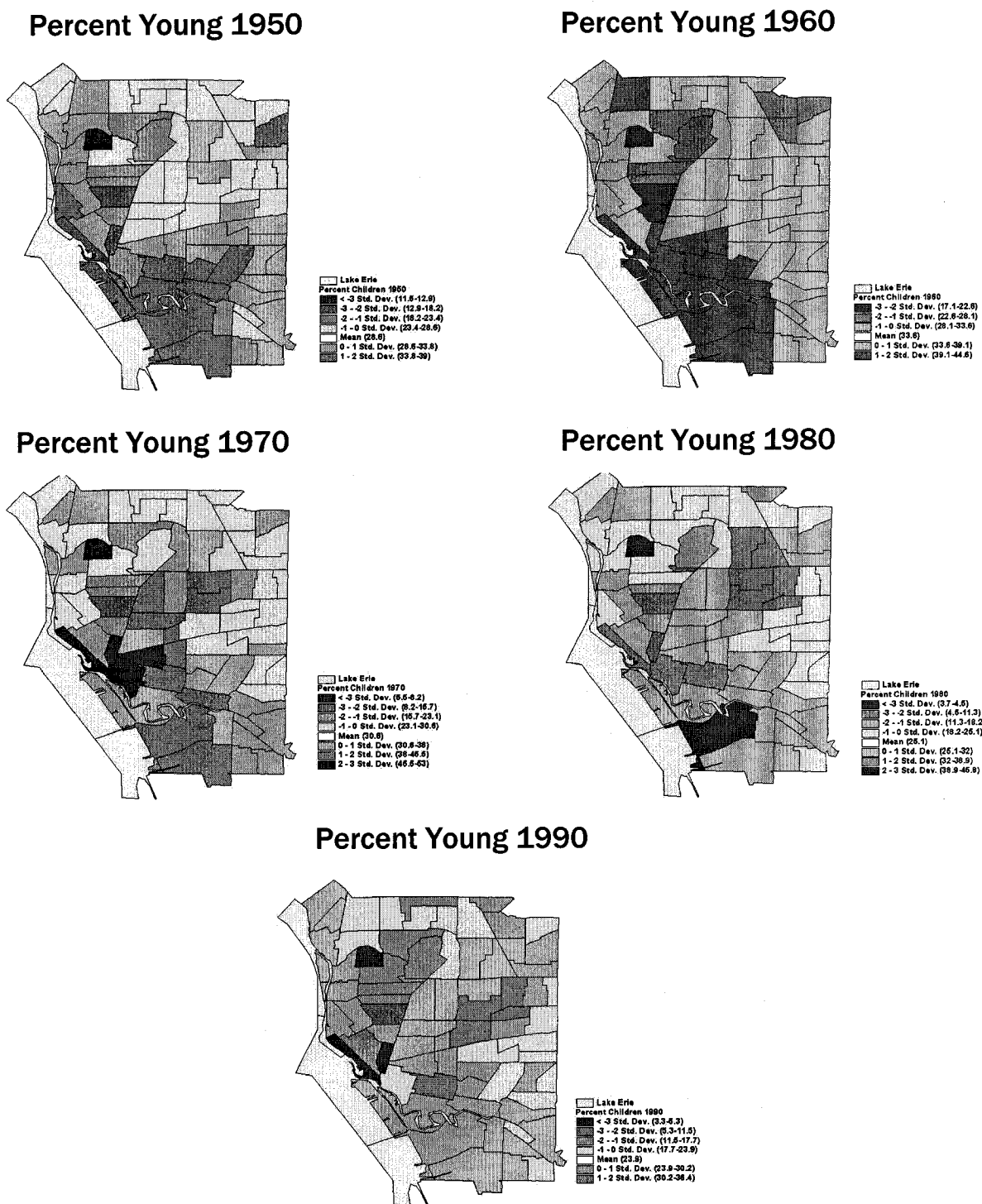
**Percent Black 1980**



**Percent Black 1990**

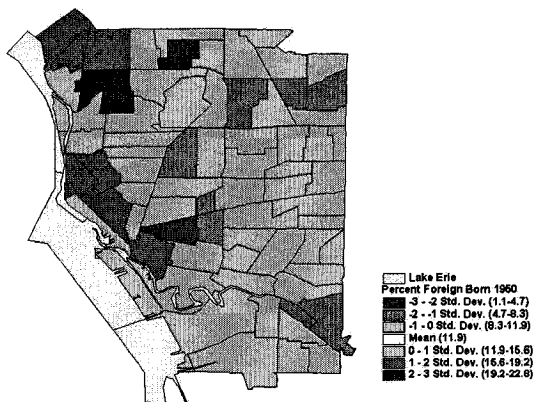


**FIGURE 4.18: Percent Black in Tract in Standard Deviation Units for Buffalo, 1950 through 1990**

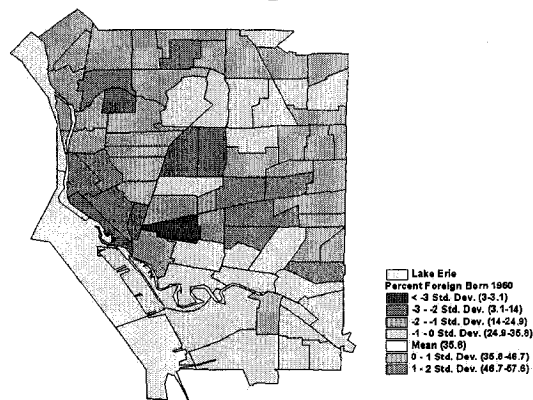


**FIGURE 4.19: Percent Young Population in Tract in Standard Deviation Units for Buffalo, 1950 through 1990**

**Percent Foreign Born 1950**



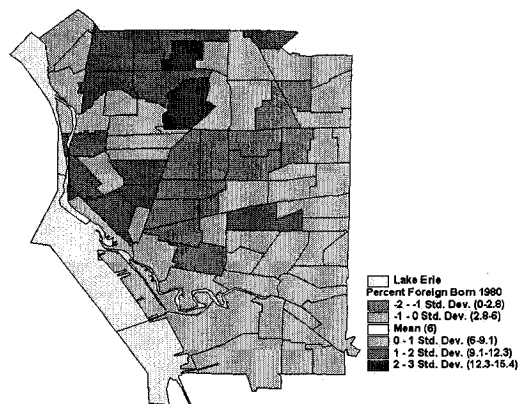
**Percent Foreign Born 1960**



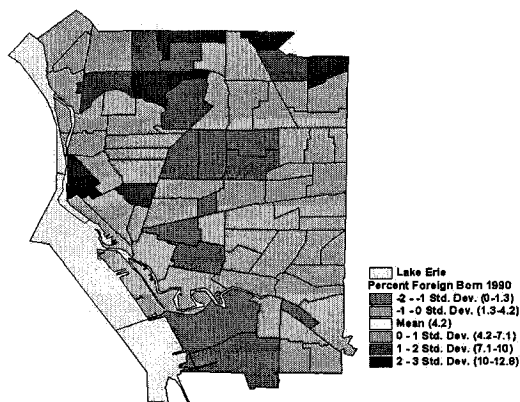
**Percent Foreign Born 1970**



**Percent Foreign Born 1980**



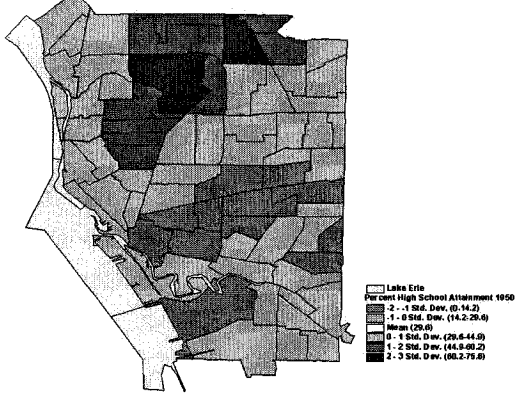
**Percent Foreign Born 1990**



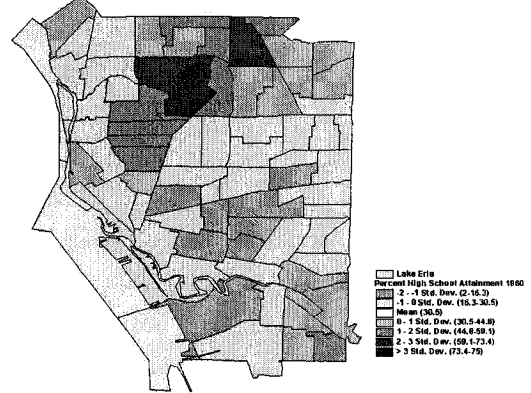
**FIGURE 4.20: Percent Foreign Born in Tract in Standard Deviation Units for Buffalo, 1950 through 1990**



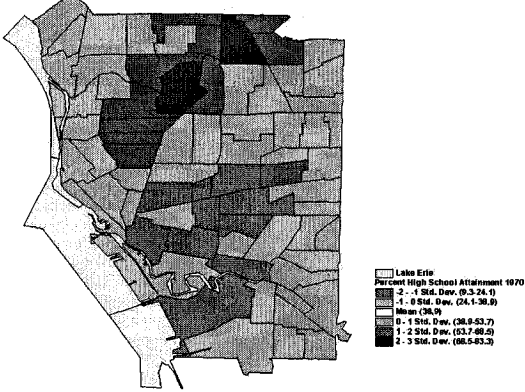
**Percent High School Attainment 1950**



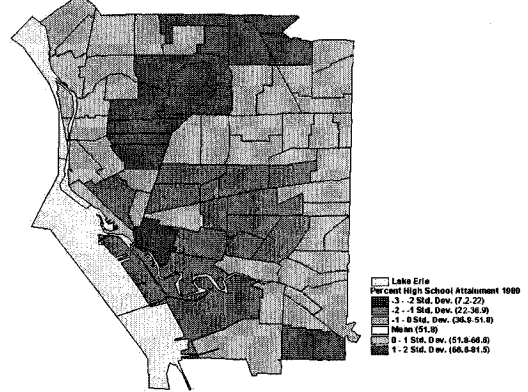
**Percent High School Attainment 1960**



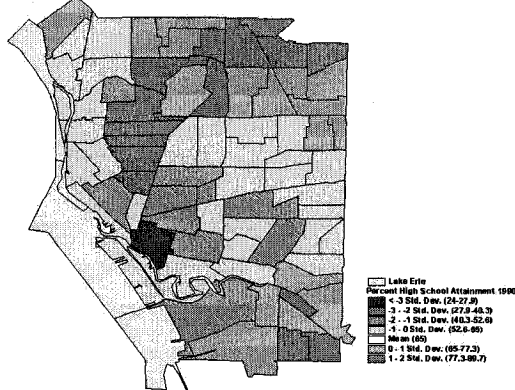
**Percent High School Attainment 1970**



**Percent High School Attainment 1980**

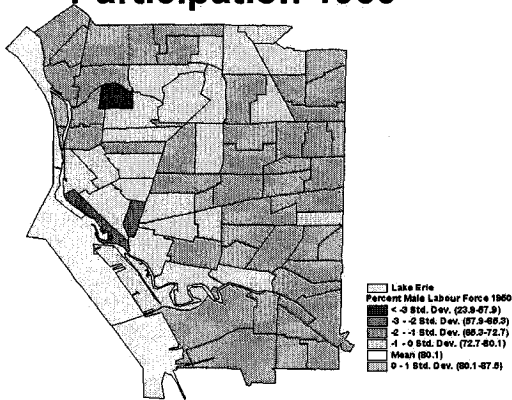


**Percent High School Attainment 1990**

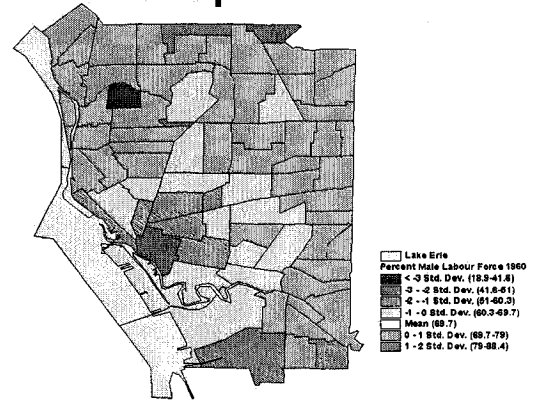


**FIGURE 4.21: Percent High School Attainment in Tract in Standard Deviation Units for Buffalo, 1950 through 1990**

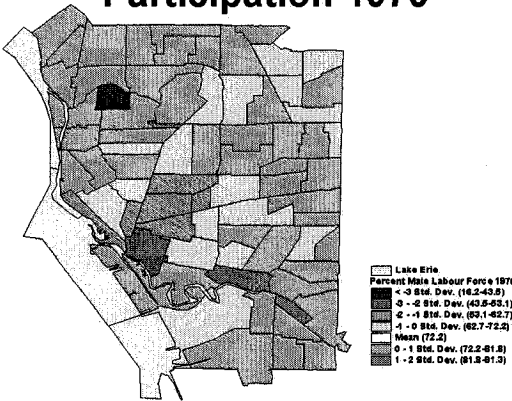
**Percent Male Labour Force Participation 1950**



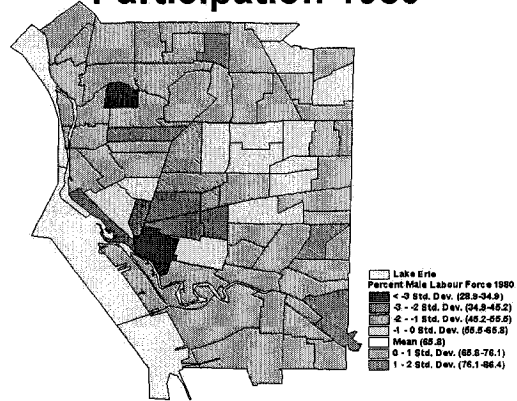
**Percent Male Labour Force Participation 1960**



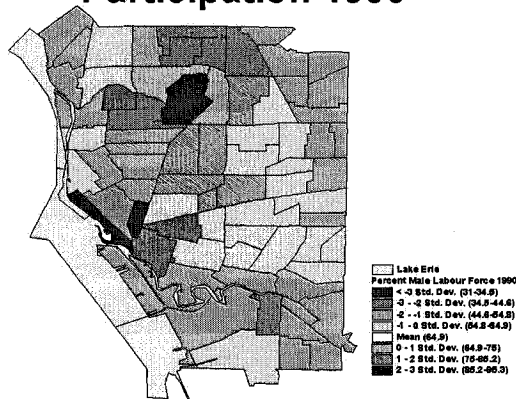
**Percent Male Labour Force Participation 1970**



**Percent Male Labour Force Participation 1980**

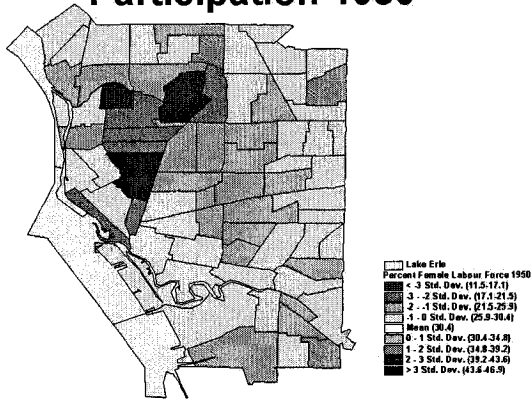


**Percent Male Labour Force Participation 1990**

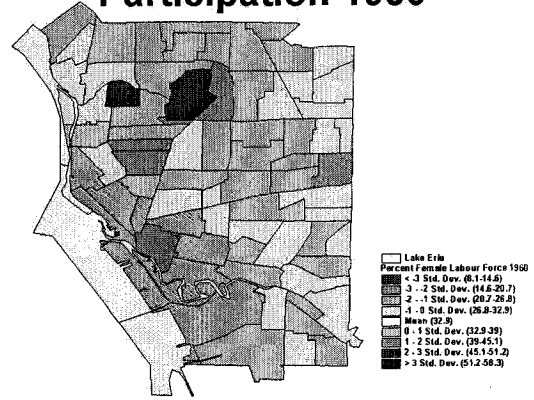


**FIGURE 4.22: Percent Males in the Labour Force in Tract in Standard Deviation Units for Buffalo, 1950 through 1990**

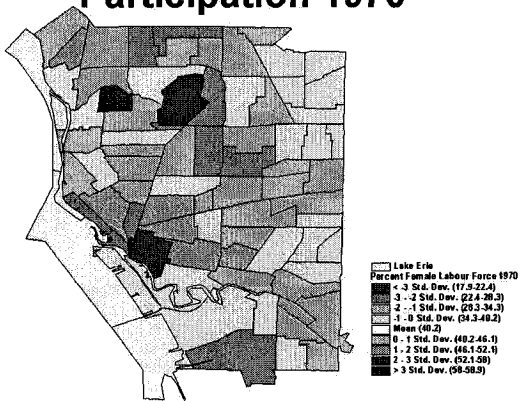
**Percent Female Labour Force Participation 1950**



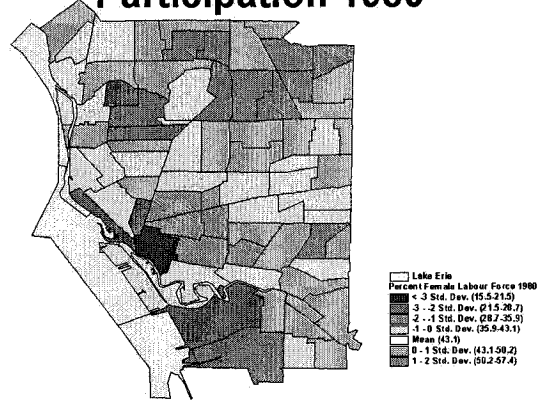
**Percent Female Labour Force Participation 1960**



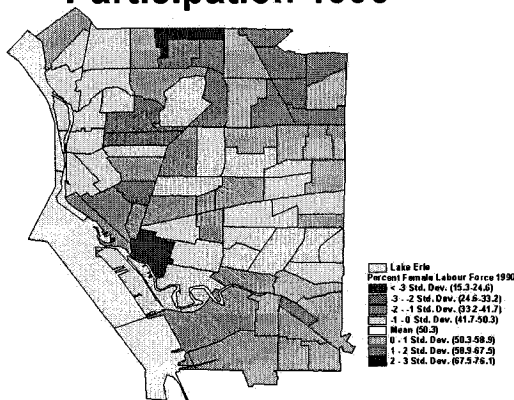
**Percent Female Labour Force Participation 1970**



**Percent Female Labour Force Participation 1980**

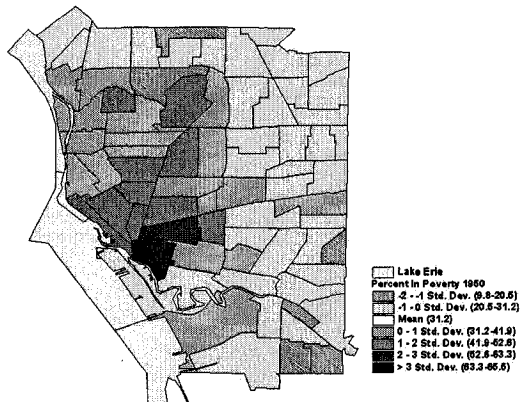


**Percent Female Labour Force Participation 1990**

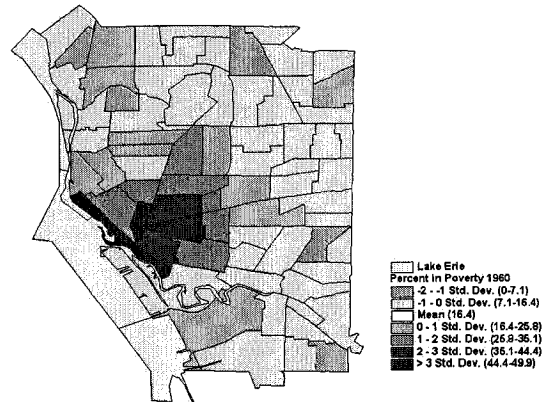


**FIGURE 4.23: Percent Females in the Labour Force in Tract in Standard Deviation Units for Buffalo, 1950 through 1990**

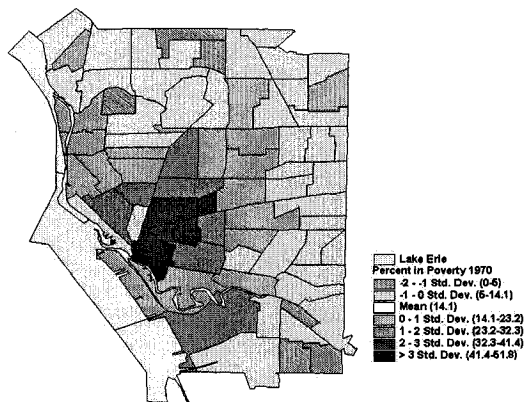
**Percent in Poverty 1950**



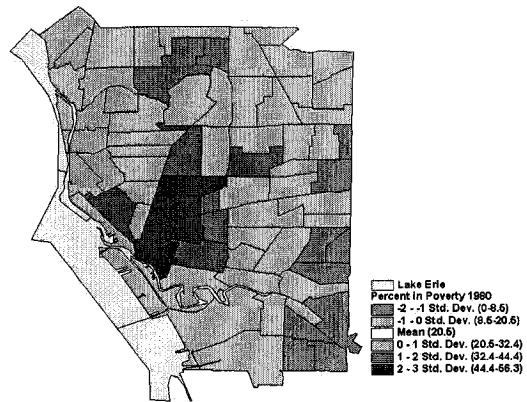
**Percent in Poverty 1960**



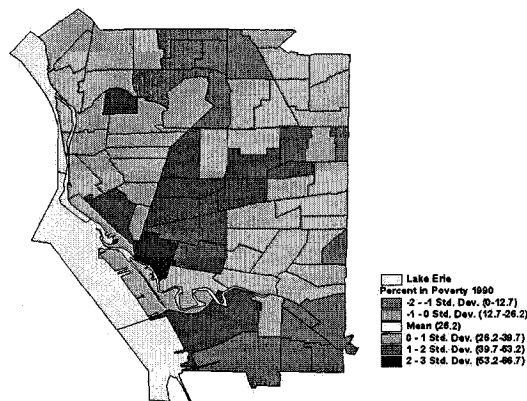
**Percent in Poverty 1970**



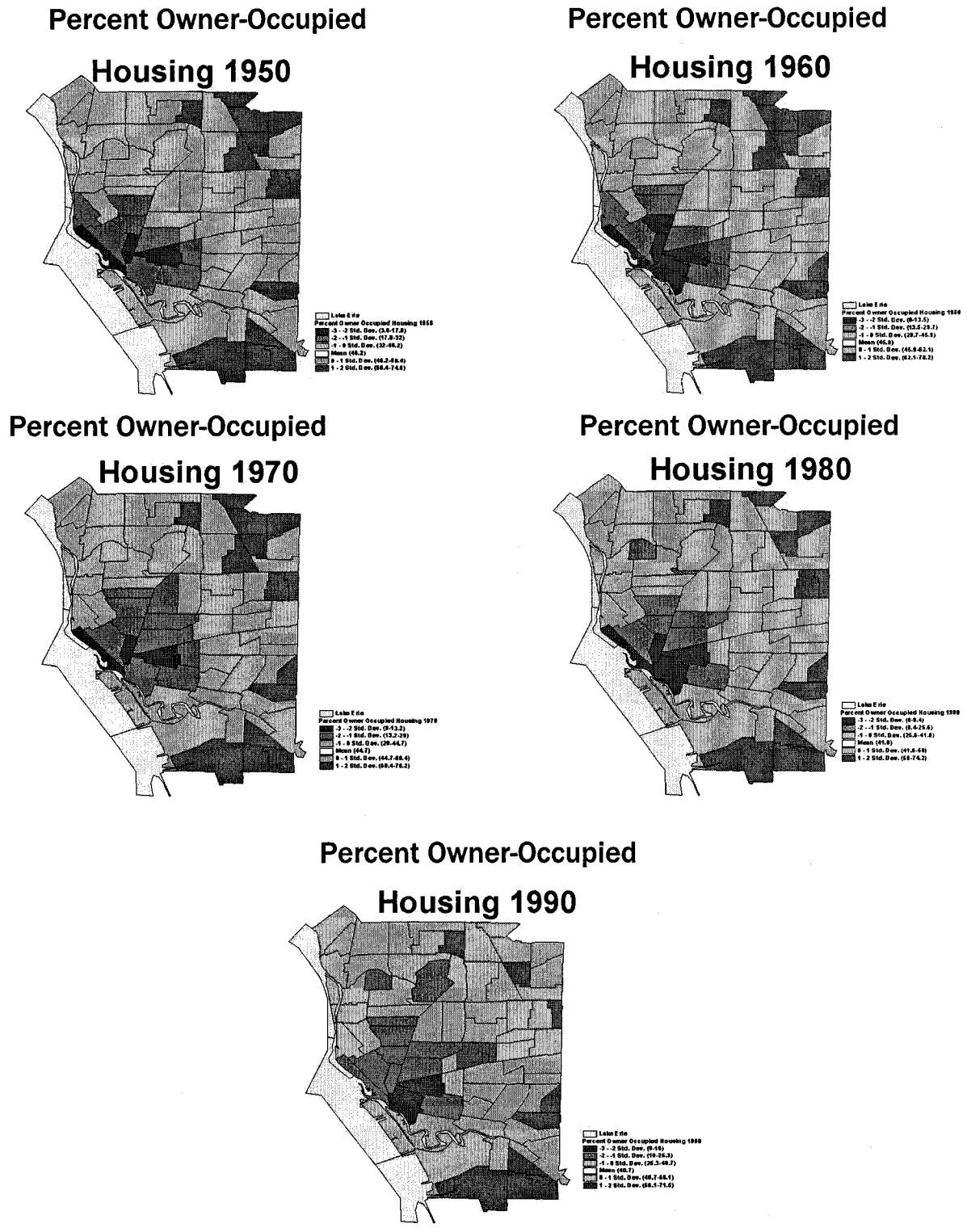
**Percent in Poverty 1980**



**Percent in Poverty 1990**

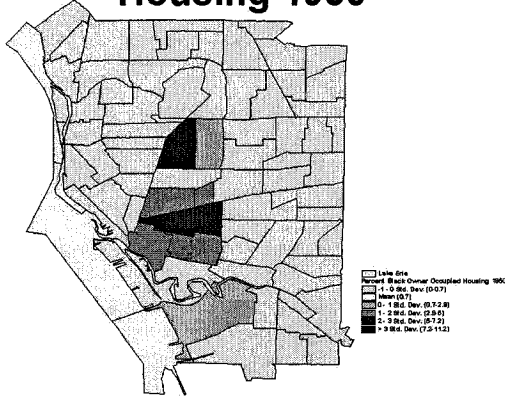


**FIGURE 4.24: Percent in Poverty in Tract in Standard Deviation Units for Buffalo, 1950 through 1990**

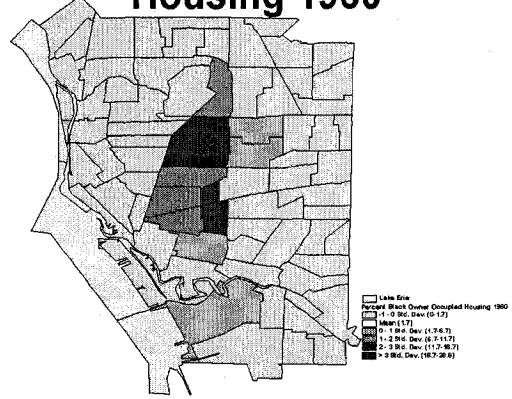


**FIGURE 4.25: Percent Owner-Occupied Housing in Tract in Standard Deviation Units for Buffalo, 1950 through 1990**

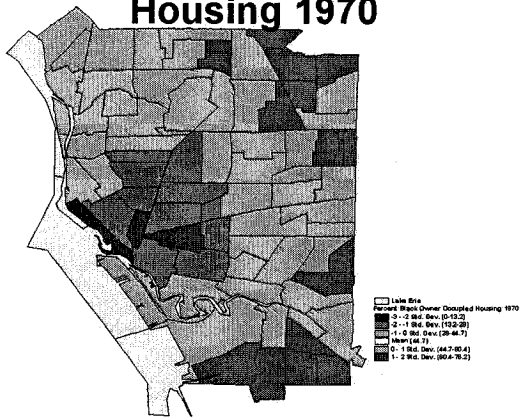
### Percent Black Owner-Occupied Housing 1950



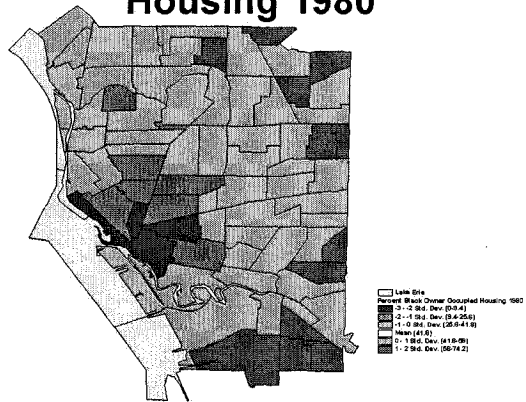
### Percent Black Owner-Occupied Housing 1960



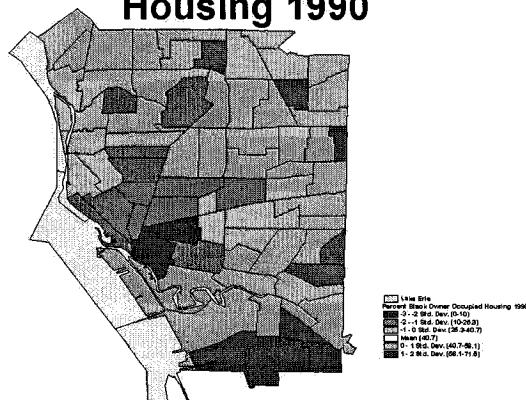
### Percent Black Owner-Occupied Housing 1970



### Percent Black Owner-Occupied Housing 1980

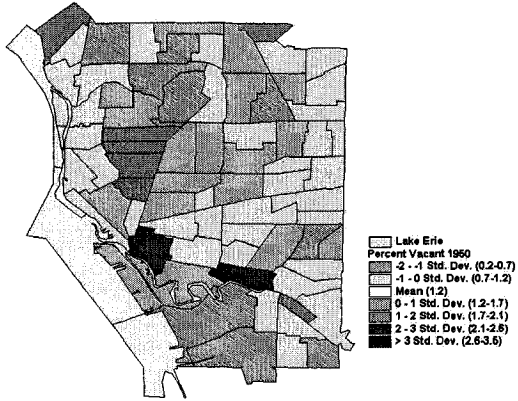


### Percent Black Owner-Occupied Housing 1990

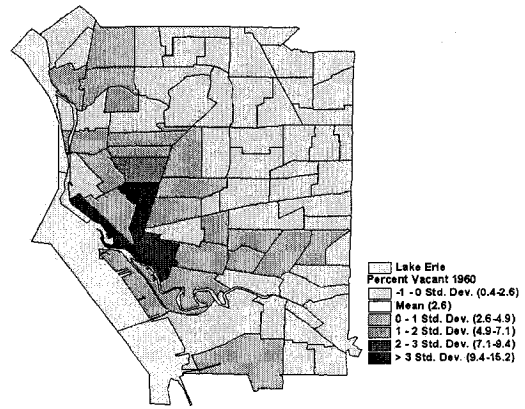


**FIGURE 4.26: Percent Black Owner-Occupied Housing in Tract in Standard Deviation Units for Buffalo, 1950 through 1990**

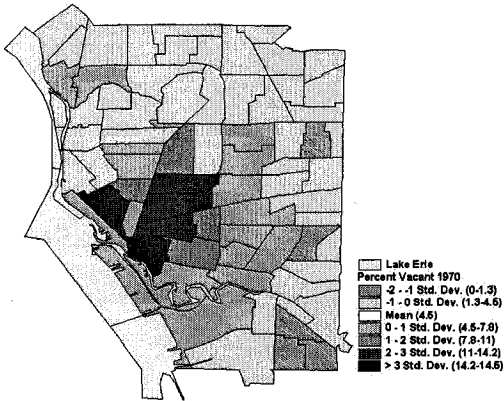
**Percent Vacant 1950**



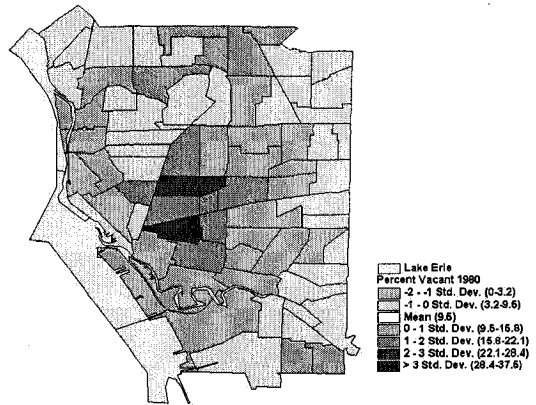
**Percent Vacant 1960**



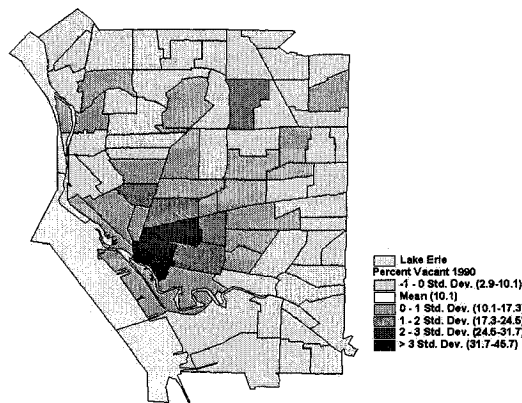
**Percent Vacant 1970**



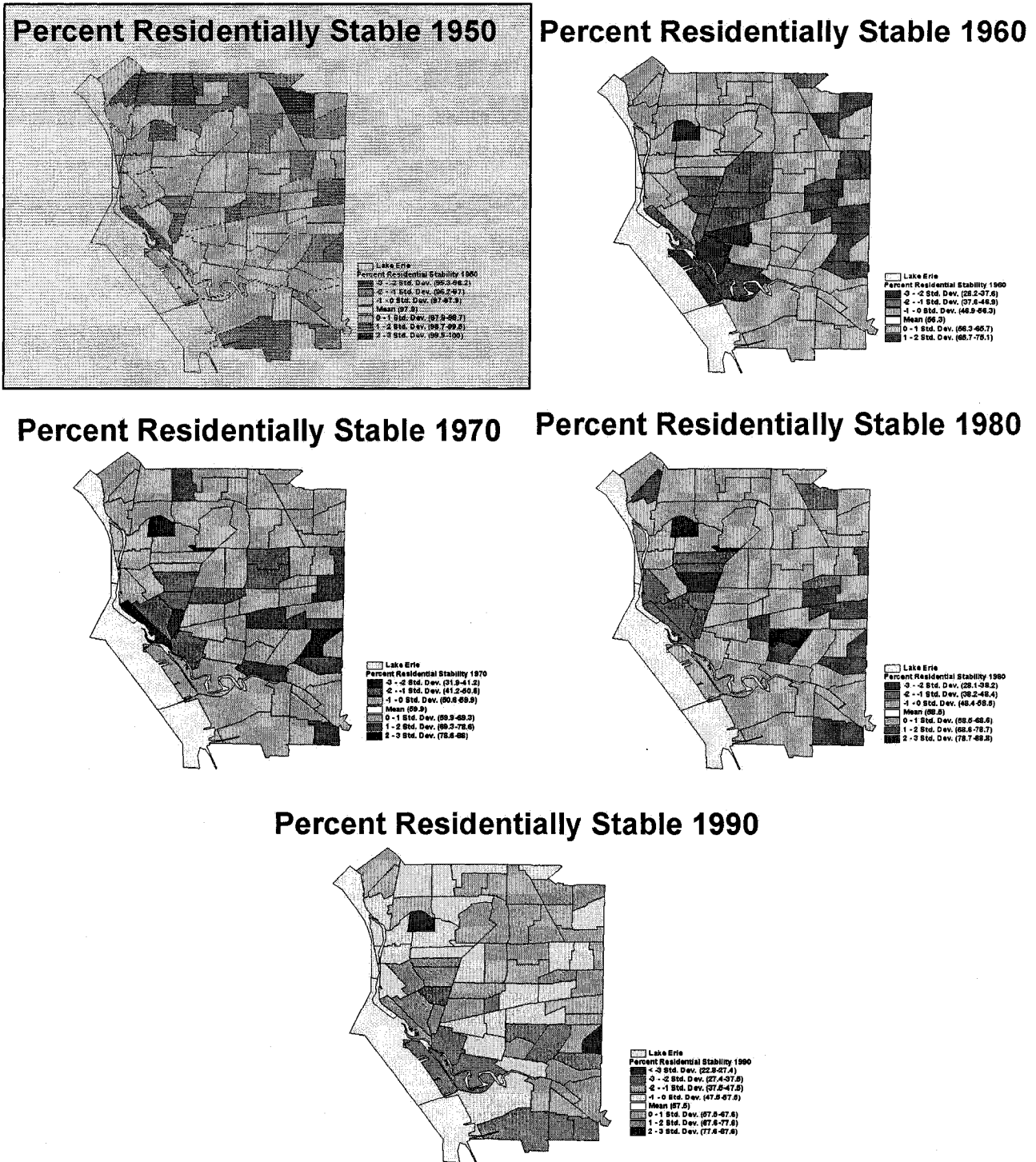
**Percent Vacant 1980**



**Percent Vacant 1990**



**FIGURE 4.27: Percent Vacant Housing in Tract in Standard Deviation Units for Buffalo, 1950 through 1990**



**FIGURE 4.28: Percent Residentially Stable in Tract in Standard Deviation Units for Buffalo, 1950 through 1990\***

\*The variable measuring residential stability at the 1950 census was not consistent with later years. This map does *not* illustrate the percentage of persons living in the same house five years prior.



## **CHAPTER V. STABILITY & CHANGE IN NEIGHBOURHOOD CHARACTERISTICS**

The purpose of this chapter is to examine the extent to which the various demographic, socioeconomic, and housing characteristics described in Chapters 3 and 4 cluster together in Buffalo neighbourhoods over time. This analysis quantifies the degree of overlap in neighbourhood characteristics that was visually apparent in Figures 4.18 through 4.28 (see Chapter 4). I address one key question in this chapter: is there stability in the types of characteristics that significantly cluster together over time, or are the types of characteristics that intersect in neighbourhoods historically contingent? To answer this question, I employ principle components factor analysis on neighbourhood variables at each decade between 1950 and 1990. The objectives of these analyses are twofold.

First, the extant literature is equivocal on whether there will be changes in the combinations of characteristics that cluster together in neighbourhoods over time. For instance, one way of interpreting the early research of Shaw and McKay (1942) is that the socioeconomic and housing characteristics of neighbourhoods are likely to remain static despite perpetual demographic changes in the residential population. Their studies of Chicago neighbourhoods between 1900 and 1933 show that socioeconomic disadvantage persists in the 'zone of transition' because these transitional neighbourhoods are initial (and short-term) destinations for immigrants (Park, Burgess and McKenzie 1925; Shaw and McKay 1942). Neighbourhoods in the zone of transition exhibited the highest rates of juvenile delinquency throughout the period they examined. In effect then, while residential turnover was constant, and therefore the demographic characteristics of the neighbourhoods were continually in flux, the socioeconomic and housing-related features

of these neighbourhoods were generally stable. These findings held over the three decades of their study.

More recent research by Wilson (1987) and others argue that accumulating disadvantage, resulting in concentration effects, typifies postwar inner city neighbourhoods (see also Sampson and Wilson 1995; Wacquant and Wilson 1989). This challenges the notion of stability in the kinds of neighbourhood characteristics that cluster together. Rather, a growing number of demographic, socioeconomic, and housing disadvantages are considered to distinguish high poverty neighbourhoods, particularly since the 1970s. Notably, the one characteristic that varied continuously in Shaw and McKay's high crime neighbourhoods (i.e. neighbourhood demographic composition), is actually the feature of contemporary urban ghettos that is relatively fixed according to Wilson. That is, since the 1970s lower class African Americans have found themselves trapped in high crime neighbourhoods.

While not entirely antithetical, the arguments made by Shaw and McKay compared to those of Wilson and more recent scholars suggest conflicting notions about how neighbourhood characteristics cluster together, and moreover, whether the characteristics that cluster together vary over time. These arguments provide the foundation for exploring what I refer to as historical invariance, or alternatively, historical contingency in the composition of Buffalo neighbourhoods between the 1950s and the 1990s.

Second, the more practical concern in neighbourhood-level research is a methodological one – if neighbourhood characteristics do dramatically covary, then they will be highly correlated. Disentangling the unique contribution of each in explaining the

spatial distribution of homicide would be impossible. In factor analyzing the eleven independent variables for this study, I am able to reduce multicollinearity that would otherwise make the explanatory modeling presented in Chapter 6 untenable. The results below are thus important for both substantive and methodological reasons.

Chapter 5 proceeds as follows. I begin with a brief review of the literature on the characteristics that describe urban neighbourhoods. Special attention is focused on the extent to which distinct combinations of characteristics that are shared in neighbourhoods are expected to be historically invariant or, alternatively, contingent over time. This is followed by an outline of the methodology and a presentation of the results of five separate factor analyses performed at each of the postwar decades through the end of the twentieth century. The chapter concludes with a discussion of four major comparisons in factor structure that were identified in the analyses. From the results presented here, I show that both historical invariance *and* historical contingency are evident in the neighbourhood characteristics that cluster together in Buffalo between the 1950s and the 1990s. In the concluding section, I describe the relevance of these findings for examining the spatial distribution of homicide in Chapter 6.

## **5.1 LITERATURE REVIEW**

### **5.1.1 Historical Invariance**

...The slum I speak of is our own. We made it, but let us be glad that we have no patent on the manufacture. It is not, as one wrote with soul quite too patriotic to let the Old World into competition on any terms, "the offspring of the American factory system." Not that, thank goodness! It comes much nearer to being a slice of original sin which makes right of might whenever the chance offers. When to-day we clamor for air and light and water as man's natural rights because necessary to his being, we are merely following in the track Hippocrates trod twenty-five centuries ago. How like the slums of

Rome were to those of New York any one may learn from Juvenal's Satires and Gibson's description of Rome under Augustus.

-Jacob A. Riis (1902: 9), a reporter and social reformer who documented New York City slums between 1880 and 1890 in *The Battle with the Slum*

Academic researchers, writers of literary fiction, and reporters have all richly documented the characteristics of neighbourhoods inhabited by members of the lower-class and the working-poor – neighbourhoods that typically exhibit the highest levels of violence. And, as Riis (1902) notes, the particulars of these places vary little over history.

Indeed, the key premise of Shaw and McKay's (1942) seminal work outlining social disorganization theory was built around the notion of a relative historical invariance in the types of characteristics that intersect in neighbourhoods. In turn, this stability in neighbourhood characteristics was theorized to produce stability in the ecology of high crime neighbourhoods of Chicago. That is, high poverty neighbourhoods tended to be destination spots for new migrants who could not afford to move into more expensive areas of the city. These neighbourhoods experienced rapid population turnover and ethnic heterogeneity, as financially-able residents vacated at the first opportunity. Combined, poverty, ethnic heterogeneity, and residential mobility inhibited the formation of neighbour networks and reduced the capacity of neighbourhood residents to recognize their common goals (Sampson and Groves 1989). Unchecked by social controls, crime and delinquency flourished in these socially disorganized neighbourhoods that bordered the central business district.

Yet the growing literature estimating aggregate effects on crime following Shaw and McKay's study through the 1980s revealed inconsistencies in the characteristics that predicted violence. In a comprehensive meta-analysis of the key ecological

characteristics related to homicide, Land, McCall and Cohen (1990: 922) argued that "...[the] apparent variance of findings may be due to statistical or methodological artifacts of particular studies, such as different time periods covered, units of analysis, samples, model specifications, and problems of statistical analysis and inference." To remedy this problem, the authors examined eleven common structural covariates of homicide<sup>57</sup> used in previous studies, at multiple levels of analysis (cities, metropolitan areas, and states) and across different time periods (1960, 1970, and 1980). They discovered two factors that were invariant over time and across geographic units in predicting homicide rates. The first was a 'population structure' factor that consisted of population size and population density. The second was a 'resource deprivation/affluence' factor that included median family income, the percentage of families living below the official poverty line, the Gini index of income inequality, percentage black, and percentage of children under 18 not living with both parents.

While Land et al. did not include neighbourhoods as a unit-of-analysis, their results, taken together with the bulk of current neighbourhood-level research, suggest that neighbourhoods distinguished by economic disadvantage and other social dislocations foster criminogenic conditions. An invariance in the features that combine together over time is further suggested by the similarities between the characteristics of present-day high poverty neighbourhoods and descriptions of nineteenth and early twentieth century 'slums' (Riis 1902; Gans 1962; Suttles 1968).

---

<sup>57</sup> The variables included in Land et al.'s (1990) study were: population size, population density, percentage black, percentage aged 15 to 29, percentage divorced, percentage of kids with both parents, median family income, percentage of families in poverty, the Gini index of income inequality, percentage unemployed, and a dummy variable for the South.

### 5.1.2 Historical Contingency

While some of the extant literature shows evidence for historical invariance in the characteristics of neighbourhoods that cluster together to produce crime, other researchers argue that we do not, and should not, expect to see invariance in the neighbourhood predictors of violence over longer time periods and/or over time periods in which rapid ecological changes are happening in cities. For example, Bursik (1986b) investigated whether there was stability in the neighbourhood characteristics that predicted juvenile delinquency in Chicago across four ten-year periods.<sup>58</sup> In his study, rapid compositional changes in Chicago's population after the 1930-40 period produced varying results across analyses. More specifically, the post WWII period was one of "ecological redefinition" as a function of rapid suburbanization (see also Bursik 1984). Variation, and not stability, in the neighbourhood characteristics that combine together is evident when the analyses are conducted over time periods coinciding with dramatic economic and social change in urban areas.

Poverty, or more accurately, concentrations of extreme poverty have been found to characterize a larger proportion of inner-city neighbourhoods in recent years compared to the past (Jargowsky 1997; Krivo et al. 1998; Ricketts and Sawhill 1988; Wilson 1987). Jargowsky (1997) shows that Buffalo, bucking the trend of other cities in the Mid-Atlantic region, had large increases in the share of African Americans living in high poverty tracts<sup>59</sup> during both the 1970s and the 1980s. His findings are consistent with Wilson's (1987) argument that low-income African Americans have faced increasingly

---

<sup>58</sup> Bursik (1986b) examined the factor loadings of residual change scores for density, owner-occupied housing, unemployment, percent non-white, and percent foreign born. He compared the results across models for 1930-40, 1940-50, 1950-60, and 1960-70.

<sup>59</sup> Jargowsky (1997) refers to this phenomenon as 'ghetto expansion.'

poor economic prospects, which further limit their opportunities for residential mobility out of inner-city ghettos. The increasing concentration of poverty, combined with growing social and economic dislocations, in minority neighbourhoods are the basis of Wilson's (1987) 'social transformation' theory. Thus, historical contingency of the characteristics that cluster in poor neighbourhoods is expected to result from the social transformation process affecting America's post-industrial urban centres.

Recent research also prompts a reconsideration of the link between residential mobility and economic disadvantage in neighbourhoods. In the mid-twentieth century, neighbourhoods in the 'zone of transition' experienced heightened residential mobility among those financially able to vacate what were perceived to be 'declining' neighbourhoods (Shaw and McKay 1942). Residential segregation intensified this racially-divided process whereby whites 'fled' the inner-city as African Americans migrated to it. For instance, soon after WWII whites in Buffalo began vacating the city and this migration continued to gain momentum throughout the 1950s. Goldman (1990) indicates that white exodus in Buffalo was the fastest of any city in the nation during the immediate postwar period.

More recently, however, researchers have identified a shift in migration patterns among those residing in poor neighbourhoods. Middle-class black residents began vacating the poorest neighbourhoods in the 1960s and 1970s for nearby middle-class neighbourhoods<sup>60</sup> (Patillo-McCoy 1999). Those left behind found it increasingly difficult to migrate out of the neighbourhood as a result of financial constraints and racial

---

<sup>60</sup> Patillo-McCoy's (1999) study focused on middle-class African Americans in Chicago; however similar intra-city migration patterns have been identified in other American cities (Wilson 1987). Even DuBois' (1899) early study of the Seventh Ward in Philadelphia demonstrated a pattern of concentrated disadvantage among low-income African Americans residing only a few streets away from more prosperous blacks at the turn of the twentieth century.

discrimination (Massey and Denton 1993; Wilson 1987). The conditions for those remaining included over-crowded rental housing stock, owned by absentee landlords, distributed amidst vacant housing units (Goldman 1990; Von Hoffman 2003). Thus, stunted residential mobility may better describe current conditions in many poor inner-city neighbourhoods, rather than high residential mobility.

Evidence for historical contingency in the characteristics that overlap in disadvantaged neighbourhoods has been emphasized most strongly by historians. They argue that the relationship between ecological characteristics and violence differs when examined over a larger historical period. Adler and Gallant (2000) provide a number of examples of American cities in the late nineteenth century with exceptionally low levels of violence despite labour unrest, high density, extensive poverty, increasing heterogeneity, and poor housing.<sup>61</sup> Yet these represent some of the very features associated with violence in contemporary inner-city neighbourhoods. It is important, then, to empirically examine whether there is historical contingency or invariance in the characteristics that cluster together in Buffalo's neighbourhoods before assessing the influence of those characteristics on homicide in the next chapter. For, in the words of Roger Lane, "...some acquaintance with the past is needed, then, if only to tell what is genuinely novel in our contemporary world from what is not" (Lane 1997: 305).

---

<sup>61</sup> For example, at the end of the nineteenth century the city of Chicago had a homicide rate five times lower than the current rate despite labour unrest and densely packed inner-city slums (Adler and Gallant 2000). Similarly, late nineteenth century New York City evidenced extremely low homicide rates while experiencing increasing heterogeneity of the population and "...the highest residential density in the history of mankind" (*ibid.*: 49).



## 5.2 METHOD

To assess whether and how the shared characteristics of neighbourhoods may have shifted over time, I compare the results of the factor analyses from each of the five decades. This analysis allows me to examine evidence for the historical contingency or invariance in the combinations of characteristics that overlap in neighbourhoods across decades. Following from the description and analyses in Chapters 3 and 4, the included variables capture demographic features (i.e., percent black, percent foreign born, and percent young), socioeconomic features (i.e., percent completing high school, percent males not in the labour force, percent females not in the labour force, and percent below the poverty line), and housing features (i.e., percent owner-occupied housing, percent black owner-occupied housing, percent vacant housing units, and percent residentially stable) of neighbourhoods.<sup>62</sup>

While the factor analyses conducted in this chapter are exploratory in nature,<sup>63</sup> they are conducted across five distinct time periods to determine whether and how demographic, socioeconomic, and housing variables load on separate factors in different decades. By factor analyzing the eleven independent variables at each decade, I measure the degree of consistency in the intersection of neighbourhood characteristics on separate

---

<sup>62</sup> A number of independent variables typically employed in neighbourhood-level studies are excluded from this analysis. For instance, there are no variables measuring family structure. Common measures of family structure include the percentage of female-headed households, teenage pregnancies, and percentage divorced or separated, for example. No measure exists at the tract level for either female-headed households or teenage pregnancies in the 1950s and 1960s; and while marital status is available in the earlier years, the 1950s census data combine married/separated persons in one category and divorced/widowed in another. Theoretically, it is important to distinguish between married and divorced/separated. Thus, because of the different structure of the 1950 marital status variables, marital status is not included in this study as a measure of family structure.

<sup>63</sup> Exploratory factor analysis (EFA) is based on a philosophy that any indicator variable may be related to any factor and there are no theoretically-derived *a priori* assumptions about the structure of possible factors in the data. Generally this strategy is used as a means to an end, that is, to create factors that can be more readily used in further explanatory analyses. By contrast, confirmatory factor analysis (CFA) is itself an explanatory sort of process wherein researchers examine the extent to which variables load onto particular factors in a test of theory (Garson 2005).

factors over time. Said differently, a comparison of the results across the five decades allows me to gauge whether and how combinations of neighbourhood characteristics have shifted in Buffalo. This analysis provides evidence about the extent to which characteristics that combine in neighbourhoods are historically invariant (stable) or historically contingent (unstable).

By employing principle components factor analysis, I address two issues. First, I reduce a larger number of independent variables into a smaller set of factors that each represents an underlying construct of substantive importance. These factors capture the maximum shared variance of the set of variables examined in this study, allowing for an analysis of the neighbourhood characteristics that cluster together most closely at each decade. The second, and more technical reason to employ factor analysis is that neighbourhood-level indicators can be highly correlated. Here the objective is to derive latent constructs from the correlated indicators that, when modeled jointly, provide a better fit to the data. To refrain from doing so creates problems of multicollinearity that can produce inefficient estimates of the independent variables under examination. When the multicollinearity between variables is extremely high (for instance, when  $b \geq .80$ ), then the standard errors of the affected variables in stochastic econometric models tend to be extremely large. Diagnostic tests show that multicollinearity is indeed present among the variables I use in this study (see also Table 3.3). To estimate the models presented in Chapter 6, it is necessary to first create factor indices.

Orthogonal factors are created on a principle axis method in principle components analysis whereby the maximum variance of a linear combination of the variables is extracted in iterative steps (Garson 2005). I use one of the most common rotation

methods employed by researchers, the varimax rotation. This rotation method "...minimizes the number of variables which have high loadings on any one given factor...[and thus] yields results which make it as easy as possible to identify each variable with a single factor" (Garson 2005: 8). Using this method, the extracted factors both 1) differentiate as effectively as possible between variables that load heavily and variables that do not, and 2) are uncorrelated with one another.

There are a number of heuristics to follow in principle components factor analyses that help to determine which variables to retain in the analysis, and which to drop. Dropping a variable, in essence, means that it has enough unique variance that it is not, and should not be included as, a component of a latent construct. The *communalities* of variables indicate how much of the variance in an indicator is explained by the factors that are extracted (de Vaus 2002). This is ultimately a measure of the reliability of the indicator. Variables with high communalities have high squared multiple correlations and should be retained in the factor analysis. Another test to determine model fit is the *Kaiser-Meyer-Olkin (KMO)* statistic. The KMO is a measure of sampling adequacy that is generated for each variable separately and for the overall model to provide a formal assessment about whether the set of variables individually and jointly are appropriate for factor analysis (de Vaus 2002; Garson 2005). The overall KMO should be .60 or higher to justify the factor analysis, and each individual variable should minimally have a KMO value above .50, although values approaching 1.0 are more appropriate for analyses.<sup>64</sup>

The *eigenvalues* generated in factor analysis measure, for each factor, the variance in all variables that can be attributed to that factor. This value is computed as the sum of

---

<sup>64</sup> I included only those variables with KMO statistics above a 0.6 threshold to provide a conservative test of comparisons in factor structure across decades.

the squared factor loadings for each variable on the factor. Following the Kaiser criterion, all factors with an eigenvalue below 1.0 are dropped from the analysis (Garson 2005). The items that load on a factor with an eigenvalue below 1.0 are modelled as unique independent variables in further analyses. These diagnostics are provided for each factor analysis described in the results section below.

### **5.3 RESULTS**

The results for the factor analyses conducted on demographic, socioeconomic, and housing variables at each decade are provided in turn. The first stage of the analyses involved an initial varimax principle components analysis of the eleven<sup>65</sup> independent variables. An inspection of the individual KMO statistics and the communalities for each variable provided a basis on which to determine the variables that would be omitted from further analyses. This process was repeated until the communalities were uniformly high, the model KMO was above .60, and the individual KMO statistics were all above .60. Four variables were reverse-coded so that indicators loaded on factors in the same direction.<sup>66</sup> The factor analyses results are presented by decade followed by a discussion comparing the composition of extracted factors over time.

#### **5.3.1 Factor Analysis: 1950**

Four separate factor analyses were conducted on the demographic, socioeconomic, and housing variables for neighbourhoods in the 1950s before a viable

---

<sup>65</sup> For the analysis of neighbourhood characteristics in the 1950s, the percent residentially stable was omitted as this variable was not comparable to the 1960s through 1990s measure. Only ten variables were used in the 1950s analysis.

<sup>66</sup> Percent foreign born was reverse coded to percent native born (100 minus percent foreign born), percent completing a high school diploma was reverse coded to percent not completing high school, percent owner-occupied housing was reverse coded to percent non-owner-occupied housing, and percent residentially stable was reverse coded to percent residentially mobile.

two-factor solution emerged. In the first analysis, percent young, percent males not in the labour force, and percent females not in the labour force had KMO statistics below 0.5. After removing these three variables, the second analysis on the remaining characteristics showed the KMO statistic for percent vacant to be below 0.6. The third analysis produced a factor solution with an unacceptable communality for percent not completing high school (0.25). Thus, the final factor analysis excluded these five neighbourhood characteristics from consideration. Each of these excluded variables has sufficient unique variance to be included as single items in the multivariate analyses for Chapter 6.

The final factor analysis for 1950 had an overall KMO statistic of .68. The KMO statistics for individual variables ranged from .65 (for percent black) to .71 (for percent in poverty), and communalities for each of the variables were high (see Table 5.1 for 1950 KMO statistics and communalities). Table 5.2 provides the rotated component matrix, or the factor loadings, for the two factor solution. The first factor included percent in poverty and percent non-owner-occupied housing with a total eigenvalue of 2.87. The second factor was comprised of percent black, percent native born, and percent black owner-occupied housing, with an eigenvalue of 1.45. In a separate reliability analysis, variables comprising the first factor were determined to have a Cronbach's Alpha ( $\alpha$ ) of 0.86 and those on the second factor had an alpha of 0.49.<sup>67</sup>

---

<sup>67</sup> Cronbach's Alpha is the most commonly employed measure of internal consistency, or reliability, in a scale. Alpha is sensitive to the number of items included in the scale such that it will be larger when more items are included. While researchers disagree on the acceptable cut-off for alpha, most argue that an alpha of at least 0.7 is required for a set of items to be considered internally consistent (Garson 2005). The aim of a reliability analysis is typically to determine whether survey items can be combined to produce a reliable and valid latent construct otherwise unobtainable from a single item indicator. The factor analyses in this chapter do not rely on survey data and are not intended to produce scales representing substantive latent constructs. Rather, the aim is to explore the extent to which neighbourhood characteristics that are highly intercorrelated can be reduced to factor indices that capture their shared variance; and moreover, to examine whether and how these relationships between neighbourhood characteristics change over five

### 5.3.2 Factor Analysis: 1960

Four factor analyses were required for the demographic, socioeconomic, and housing variables in 1960 after removal of variables with low KMO statistics. The final factor analysis omitted percent not completing high school, percent young, and percent females not in the labour force, resulting in a two-factor solution. The model KMO statistic reached .74, and the KMO statistics for all indicator variables ranged from a low of .62 (for percent black owner-occupied housing) to a high of .89 (for percent vacant housing) (see Table 5.1). The first factor extracted had an eigenvalue of 4.70 and included percent in poverty, percent males not in the labour force, percent non-owner-occupied housing, percent vacant housing, and percent residentially mobile ( $\alpha = 0.83$ ; see Table 5.2). The second factor included percent black, percent native born, and percent black owner-occupied housing, with an eigenvalue of 1.50 ( $\alpha = 0.75$ ).

### 5.3.3 Factor Analysis: 1970

Three factor analyses were run for the demographic, socioeconomic, and housing variables in 1970 before a viable two-factor solution emerged. Percent young, percent females not in the labour force, and percent not completing high school were all excluded from the final factor analysis. The overall KMO statistic was .78, well above the minimum acceptable level, and the individual KMOs ranged from a low of .71 (for percent residentially mobile) to a high of .89 (for percent males not in the labour force) (see Table 5.1). The communalities of each of the variables were high, with the exception of percent males not in the labour force (0.42), however because the KMO statistic for this variable was well above 0.60 it was retained in the final factor analysis.

---

decades. As such, Cronbach's Alpha reliability measures are provided above, but they are not relied upon as a basis on which to dismantle factors obtained in the principle components factor analyses.

Table 5.2 provides the rotated component matrix for the two-factor solution. The first factor included percent in poverty, percent males not in the labour force, percent non-owner-occupied housing, percent vacant housing, and percent residentially mobile. This factor had an eigenvalue of 4.60 ( $\alpha = 0.81$ ). The second factor included percent black, percent native born, and percent black owner-occupied housing, with an eigenvalue of 1.44 ( $\alpha = 0.59$ ).

#### **5.3.4 Factor Analysis: 1980**

Two factor analyses were required to produce a final solution for neighbourhood characteristics in 1980. In the second model, both percent young and percent residentially mobile were excluded based on their low KMO statistics. The final model yielded an overall KMO score of .76 (see Table 5.1). The individual KMO statistics ranged from a low of .63 for percent black owner-occupied housing to a high of .89 for percent males not in the labour force. A two-factor solution emerged, with an eigenvalue of 4.78 for the first factor and 1.77 for the second factor. Six variables loaded onto the first factor including percent in poverty, percent not completing high school, percent males not in the labour force, percent females not in the labour force, percent non-owner-occupied housing, and percent vacant housing ( $\alpha = 0.86$ ; see Table 5.2). Percentage black, percentage native born, and percent black owner-occupied housing all loaded onto the second factor extracted in the model ( $\alpha = 0.59$ ).

#### **5.3.5 Factor Analysis: 1990**

Four separate factor analyses were run on the 1990 neighbourhood characteristics before a two-factor model emerged in the data. In the final model, eight variables warranted inclusion, with percent young, percent native born, percent black owner-

occupied housing, and percent residentially mobile excluded. The KMO score for the final model was .77 (see Table 5.1). KMO statistics for individual variables in the final model ranged from .65 (for percent black) to .94 (for percent males not in the labour force).

Table 5.2 provides the rotated component matrix indicating the factor loadings of each variable for the 1990 model. The first factor to emerge from the data yielded an eigenvalue of 4.51 and included percent in poverty, percent not completing high school, percent males not in the labour force, and percent females not in the labour force ( $\alpha = 0.90$ ). The second factor included percent black, percent non-owner-occupied housing, and percent vacant housing. This factor had an eigenvalue of 1.03 ( $\alpha = 0.56$ ). However, the variable for percent in poverty had a factor loading of .67 on the first factor and .65 on the second factor. Following conventional wisdom, in an already rotated solution, the highest factor loading is indicative of the proper categorization of the variable. Therefore, this variable technically loads on the first factor; however factor loadings for percent in poverty are reported for both 1990 factors to acknowledge the similarity in loadings (see Table 5.2).

#### **5.4 DISCUSSION**

These factor analyses provide empirical evidence for both historical contingency *and* historical invariance in the characteristics that intersect in Buffalo's neighbourhoods between the 1950s and the 1990s. The results show moderate stability in some of the variables that cluster together, and yet key differences in factor structure emerged at almost every decade. Specifically, the analyses in this chapter demonstrate that there is



historical invariance in the factor representing a race-housing index over the post WWII period; however there is also evidence of historical contingency in the characteristics of neighbourhoods that comprise the poverty-related index.

The race-housing index including percent black, percent native born, and percent black owner-occupied housing shows historical invariance. This factor emerged in the data for four of the five decades (the 1990s were the exception). The implications of this stability are discussed in more detail below. By contrast, historical contingency is suggested such that shifting characteristics are associated with high poverty in neighbourhoods at different decades. In particular, neighbourhoods burdened with high poverty experienced a growing number of other socioeconomic and housing disadvantages between the 1950s and the 1980s, and the particular characteristics that clustered with poverty varied over time.<sup>68</sup> Again, the implications of this evidence for historical contingency will be detailed below.

The following discussion focuses on four key comparisons of the factor analyses results by decade. First, as indicated above, there was evidence of marked stability in a particular combination of three racial and housing characteristics that clustered in neighbourhoods. Second, over time an increasing number of socioeconomic characteristics were found to cluster with poverty, indicating that neighbourhood disadvantage could no longer be described as simply encompassing poverty and the housing features that accompany poverty. The features that accompanied economic disadvantage grew to include limited educational attainment and a lack of adult labour force participation. Third, factors in all decades included *either* demographic and

---

<sup>68</sup> The factor structure for both the poverty-related index and the race-housing index was identical for the 1960s and 1970s data only (see Table 5.2).

housing characteristics *or* socioeconomic and housing characteristics. The demographic features of neighbourhoods (i.e. percent black, percent native born, and percent young) and the characteristics associated with socioeconomic disadvantage (i.e. percent in poverty, percent males not in the labour force, percent females not in the labour force, and percent not completing high school) loaded on different factors almost uniformly across the five decades. Finally, compared to the earlier decades, the most variability in factor structure was found in the variables that clustered together during the 1990s. The implications of each of these comparative findings are discussed in the following four sections.

#### **5.4.1 Stability in the Race and Housing Index**

The most consistent and stable result of the factor analyses is that percent black, percent native born, and percent black owner-occupied housing all load onto one distinct index in each decade, save for the 1990s.<sup>69</sup> This finding might be expected given that the extensive residential segregation in Buffalo meant that when black residents became homeowners, they were likely to purchase those homes in neighbourhoods with high proportions of black residents. Citing a multi-city study reported in the *Atlanta Constitution* in 1989, Massey and Denton (1993) note that the rejection of savings and loan applications for potential homeowners was a racially-divided processes whereby black applicants were rejected at a rate more than twice that of whites (24 percent compared to 11 percent). In Buffalo this differential continued to widen throughout the 1980s. Even among those African American residents who became homeowners, then,

---

<sup>69</sup> During the 1990s, both percent native born and percent black owner-occupied housing demonstrated enough unique variance that they were not included in the final factor model.

extensive residential segregation across Buffalo neighbourhoods forced black homeowners to reside in black neighbourhoods.

The migration patterns of the African American population in the United States throughout the twentieth century followed a pattern of migration from the south to northern industrial centres particularly during and immediately following World War II (Johnson and Campbell 1981; Pandit and Withers 1999). The black population inhabiting Buffalo is largely a population born in the United States, and not a population who emigrated from foreign nations. Thus, it makes intuitive sense that measures of the presence of native born residents, black residents, and black homeowners would characterize a distinct neighbourhood index given the particular migration and settlement patterns of African Americans in the northern industrial cities.

What is more interesting about this race-housing index is the extent to which it remains as a stable and distinct factor in describing these neighbourhoods across four of the five periods that are examined. In the first four decades (1950s through the 1980s) the three variables that load into this factor are all directly related to race (i.e. percent black and percent black owner-occupied housing) or other neighbourhood demographic features (i.e. percent native born). Only in the 1990s did this factor structure change such that the “race” index now included substantial factor loadings from percent non-owner-occupied housing and percent vacant. In addition, Table 5.2 illustrates that, for 1990, the factor loadings for percent in poverty differ very little across the “poverty-related” (0.665) and the “race-housing” (0.652) factors. This suggests that while poverty shares slightly more variance with the other socioeconomic characteristics that comprise the poverty-related factor, it also loads substantially with those characteristics comprising the

race-housing factor (i.e. percent black, percent non-owner-occupied housing, and percent vacant). It could be argued, then, that the two factors describing Buffalo neighbourhoods – which I have labelled as “race-housing” and “poverty-related” – appear to become less distinct in 1990.

One explanation for the reduced distinction in the types of variables that load on the race-housing factor and the poverty-related factor in the 1990s may be drawn from a parallel between the East Side of Buffalo, particularly Buffalo’s Fruit Belt neighbourhoods, and the inner city neighbourhoods of Chicago described by Wilson (1987). The East Side neighbourhoods that border Buffalo’s downtown are predominantly African American and poor. Taylor and Cole (2001: 14) argue that while in the 1990s residents of the Fruit Belt lived in close proximity to a large Medical Complex, and thus were theoretically exposed to job opportunities, there was a “spatial mismatch”<sup>70</sup> in employment opportunities such that “...[s]uburbanites and Buffalonians, who live in other parts of the city [held]...about 95 percent of the jobs [in this facility]” (see Keating and Smith 1996; Wilson 1987). Moreover, demolition of residential dwellings in this low income area began during the 1960s and rapidly resulted in a dramatic decline in the number of both original and new dwellings available for residence by the end of the century (Taylor and Cole 2001). Like Chicago, the continued residential segregation in Buffalo (Massey and Denton 1993) combined with racial inequalities in employment opportunities (Turner 1991) had not only perpetuated, but

---

<sup>70</sup> The spatial mismatch hypothesis originally introduced by Kain (1968) argues that residential segregation by race causes a gap between employable African Americans in the inner city areas and jobs in the suburbs. That is, “...serious limitations on black residential choice, combined with the steady dispersal of jobs from central cities, are responsible for the low rates of employment and low earnings of Afro-American workers” (Kain 1994:371). In the case of Buffalo, a variant on the spatial mismatch hypothesis is apparent such that even when employment opportunities are available in the immediate vicinity, these jobs are often filled by employees from the suburbs.

also intensified, the socioeconomic distress of black neighbourhoods on the East Side by the end of the century.

#### 5.4.2 Concentrating Disadvantage in the Poverty Index

(T)he communities of the underclass are plagued by massive joblessness, flagrant and open lawlessness, and low-achieving schools and therefore tend to be avoided by outsiders. Consequently, the residents of these areas, whether women and children of welfare families or aggressive street criminals, have become increasingly socially isolated from mainstream patterns of behaviour...The social transformation of the inner city has resulted in a disproportionate concentration of the most disadvantaged segments of the urban black population, creating a social milieu significantly different from the environment that existed in these communities several decades ago (Wilson 1987: 58).

William Julius Wilson's description of the role of social change in producing *concentration effects* in inner city neighbourhoods suggests that the characteristics associated with high poverty areas have become more varied, producing greater concentrated disadvantage, over time. His research highlights the social isolation experienced by inner city African American residents who are left behind, once middle-class residents exit disadvantaged neighbourhoods. According to Wilson, this is a process that began in the 1960s, but the effects became increasingly acute by the late 1980s.<sup>71</sup> Without those willing and able to organize the community and mount campaigns for extra-local resources, inner city neighbourhoods continued their downward spiral. This is, according to Wilson, a race-specific problem. Hampered by the effects of historical discrimination, the urban ghettos in Chicago are predominantly black neighbourhoods.

The results of the analyses performed in this chapter are only partially supportive of Wilson's (1987) highly influential findings. In support, neighbourhood poverty in

---

<sup>71</sup> The time frame covered by Wilson's (1987) data include only the 1970s and 1980s.

Buffalo is part of a larger index of disadvantage that shares substantial factor loadings with at least two additional characteristics in four of the five decades: percent non-owner-occupied housing (which loads on the poverty-related factor at each decade except the 1990s) and percent males not in the labour force (which loads on the poverty-related factor at each decade except the 1950s). In other words, neighbourhoods that were poor were also neighbourhoods in which many residents did not own their own homes and in which a higher proportion of males were not involved in the labour force. The poverty-related factors also incorporated high percent vacant in the 1960s, 1970s, and 1980s, and high percent residentially mobile in the 1960s and 1970s.<sup>72</sup> This time frame, associated with an exodus from inner city neighbourhoods, is wholly consistent with Wilson's findings in Chicago. In the 1980s and 1990s, both percent females not in the labour force and percent not completing high school also loaded on the poverty-related index. The results of these factor analyses suggest that a larger group of characteristics associated with socioeconomic and housing disadvantages began to overlap more heavily in high poverty neighbourhoods.

Given its historic roots as a thriving industrial centre during the first few decades of the twentieth century and through both World Wars, it is perhaps not surprising that poverty would increase in the later half of the twentieth century as industry collapsed in

---

<sup>72</sup> Given the entire set of eleven variables, those that load onto each factor at any given decade maximize the shared variance across all of the independent variables. Each variable, however, may be (and, in most cases, is) correlated with many of the other eleven variables included in the set (see Table 3.3). Nonetheless, the structure of the identified factors provides a basis on which to describe underlying constructs that capture the shared variance of multiple variables, and explain the covariation among those variables that load together. Interpreting the combination of variables that load onto each of these factors allows for inferences about the nature of Buffalo neighbourhoods at each decade, as well as a comparison of factor structures over time. However, caution should be taken in assuming that the individual variables that load on distinct factors are uncorrelated at the bivariate level; many of them are correlated and it is this covariation that necessitates a factor analytic strategy to begin with. What the results of these factor analyses provide is an analysis of the variables that cluster together *most closely* at each decade.

Buffalo. However these economic trends affected some neighbourhoods in Buffalo more than others. Neighbourhoods characterized by high poverty and few homeowners in the 1950s eventually became neighbourhoods characterized by high poverty, few homeowners, lower labour force participation, high vacancies, reduced educational attainment among residents, and high residential mobility in later decades. High poverty neighbourhoods bore the brunt of the economic downturn in the city of Buffalo, with the effects intensifying over time. The factor analyses verify that 'concentration effects' became more acute in Buffalo's high poverty neighbourhoods.

There are, however, two issues raised by the factor analyses results that provide less support for Wilson's well-cited thesis on concentrating disadvantage in the inner city. First, the trend toward ever greater concentrations of socioeconomic and housing problems loading on the poverty-related index ends by the 1990s. In other words, fewer characteristics load with high poverty in the 1990s, and each of these variables might be described as socioeconomic characteristics rather than housing characteristics.<sup>73</sup> It appears that, at least in Buffalo, poverty-stricken neighbourhoods of the 1990s were not experiencing the increasing concentration effects described by Wilson, and characteristic of Buffalo neighbourhoods earlier in the period. This is not to say that high poverty neighbourhoods were 'better off' in the 1990s. They were not. The poverty rate had actually increased between the 1970s and 1990s (see Figure 3.8). Rather, those neighbourhoods experiencing high poverty did not account for all neighbourhoods with few homeowners, high vacancies, or extensive residential mobility by the 1990s.

---

<sup>73</sup> The poverty-related factor in the 1990s included three other variables: percent not completing high school, percent males not in the labour force, and percent females not in the labour force. No longer were housing characteristics loading on the poverty-related factor by the 1990s.

Second, Wilson's arguments point to the largely racialized effect of these concentration effects and social isolation (see also Sampson and Wilson 1995). In other words, this process was one that affected black inner city neighbourhoods in Chicago in particular. The results of the analyses in this chapter question the generalizability of his findings to a smaller, yet similarly industrial north-eastern city over the postwar period and through the end of the century. Unlike Land, McCall and Cohen's (1990) principle components analyses of structural characteristics that have been linked to homicide at the city, SMSA, and state levels, my analyses of Buffalo neighbourhoods failed to find percent black loading with *any* socioeconomic characteristic in the final factor solutions for each decade.<sup>74</sup>

#### 5.4.3 Distinctions in Forms of Disadvantage

In previous chapters, I sorted the neighbourhood characteristics used in this study into three categories: demographic, socioeconomic, and housing features. Demographic characteristics were comprised of percent black, percent native born, and percent young. Socioeconomic characteristics were comprised of percent in poverty, percent males not in the labour force, percent females not in the labour force, and percent not completing high school. Finally, housing features included percent owner-occupied housing, percent black owner-occupied housing, percent vacant housing, and percent residentially mobile.

---

<sup>74</sup> Table 5.3 provides a comparison of the relationship between poverty level and racial composition in Buffalo neighbourhoods over time. Only during the 1970s do neighbourhoods that are majority black (50 percent or more) outnumber non-black neighbourhoods as being *either* near poverty (20 percent to 39 percent in poverty) *or* extremely poverty-stricken (40 percent or more in poverty). Even then, just over half (64 percent) of near and extreme poverty neighbourhoods were majority black during the 1970s. Buffalo was not a city wherein black neighbourhoods and poverty-stricken neighbourhoods were largely synonymous at any of the postwar decades. However, Table 5.3 does show that black neighbourhoods tended to comprise more than half of those that could be described as extreme poverty tracts after the 1950s. Majority black tracts also comprised a very low proportion of all non-poverty tracts at each decade (between 0 and 6.6 percent). Hence, there is a strong and positive zero-order correlation between percent in poverty and percent black in neighbourhoods at each decade (see Table 3.3). Overall, Table 5.3 illustrates that while majority black neighbourhoods were not the only poverty stricken neighbourhoods in the city, they were typically not the most prosperous neighbourhoods in the city.



This categorization of variables is a conceptual one, but not necessarily an empirical one. That is, the initial categorization was based on substantive similarities in the characteristics measured by each independent variable. The factor analyses provided in this chapter suggest that these conceptual distinctions do not play themselves out neatly in empirical analyses.

The factor analyses presented here illustrate a general lack of distinction between socioeconomic and housing variables in particular. That is, the poverty-related factor (which sometimes included other socioeconomic characteristics, and at other times did not) loaded with all of the housing characteristics, except percent black owner-occupied housing, at two or more decades. The demographic characteristics of neighbourhoods, on the other hand, loaded only with one another, and with housing characteristics.<sup>75</sup> The only housing characteristic to consistently load with these other demographic variables was the percentage of the population who are black homeowners – a housing characteristic that signifies affluence rather than disadvantage.

This empirical distinction between demographic characteristics, particularly percent black, and socioeconomic characteristics in Buffalo neighbourhoods is important because it distinguishes Buffalo as a case study unique from the places examined by other researchers (see Land et al. 1990). The argument for including percent black on indices with other socioeconomic characteristics assumes that percent black represents residual social disadvantage not captured by income, employment, poverty, and other relative deprivation measures. Shihadeh and Shrum (2004) argue that combining percent black with other forms of socioeconomic disadvantage, even if necessary from a

---

<sup>75</sup> Both percent black and percent native born – two of the three demographic characteristics – loaded on the same factor in four of the five decades. Percent young was not included in the final models of any of the factor analyses because it was composed of enough unique variance that it could be modeled separately.

methodological standpoint, creates confusion in interpretation such that black neighbourhoods can not be explored separately from economically disadvantaged neighbourhoods (see also Peterson and Krivo 2005). While inconsistent with previous research on other cities and based on different units of analysis (see Land et al. 1990), the results presented in this chapter allow me to distinguish the “race effect” (as captured by the “race-housing” factor) from the “socioeconomic effect” (as captured by the “poverty-related” factor) on neighbourhood homicide over time in Buffalo. This substantively important distinction, but one that has been difficult to explore in the past as a result of the extreme collinearity between poverty and race in previous studies, will be examined in Chapter 6.

#### **5.4.4 The Exceptional 1990s**

During the 1990s, the factor structure describing the characteristics that clustered together in neighbourhoods was quite different from the factor structures that emerged in previous decades. No longer was the stable and consistent race-housing factor, comprised of percent black, percent native, and percent black owner-occupied housing evident. Yet a race-housing factor of a more general sort emerged, one that included percent black, percent non-owner-occupied housing, and percent vacant. This difference, while subtle on the surface, describes a shift in the characteristics that cluster most closely together in Buffalo’s black neighbourhoods by the end of the century.

In the earlier four decades, percent black and percent black owner-occupied housing shared considerable variance and thus loaded together on the “race-housing” index. In the 1990s, however, percent black and percent non-owner-occupied housing (in addition to percent vacant) combined to form the “race-housing” index. The “housing”

portion of the race-housing index, then, shifted to include a measure of limited home ownership rather than race-specific home ownership. This signals a substantive shift in the nature of the “race-housing” index. Rather than a marker of housing affluence (if bounded by racial residential segregation) sharing variance with race in Buffalo neighbourhoods, a measure of housing deprivation began to load with percent black in the 1990s. Moreover, the high loading for percent in poverty on the race-housing factor in the 1990s (see Table 5.2), absent in earlier decades, also signifies an intensification of socioeconomic problems in Buffalo’s black neighbourhoods. While the proportion of the population that was African American continued to increase in the city from the 1980s through the 1990s (see Figure 3.2 in Chapter 3), the prospects of black neighbourhoods appeared to worsen by the last decade of the twentieth century.

The results of the factor analyses for the demographic, socioeconomic, and housing variables also differ from earlier decades to the extent that socioeconomic disadvantages formed their own distinct factor, independent of housing characteristics. That is, it was during the 1990s alone that the four socioeconomic characteristics referred to in Chapters 3 and 4 loaded onto the same factor. Neighbourhoods that were high in poverty were places where high school educational attainment was lower, and both men and women were less likely to be in the labour force. The uniqueness of the neighbourhood characteristics that cluster together in Buffalo during the 1990s illustrates an historical contingency in the structural composition of neighbourhoods, as recently as the 1990s.

#### **5.4.5 Summary**

Four comparisons between the factor structures of neighbourhoods that emerged at each decade were discussed in this section. The results showed evidence of the historical invariance in a race-housing index describing Buffalo neighbourhoods across four decades. This persistent stability was not, however, replicated in the poverty-related index that emerged for each of the factor analyses. Poverty loaded with a growing number of other socioeconomic and housing disadvantages in each postwar decade, until the 1990s.

A consistent finding across decades involved the clear distinction between demographic features of Buffalo neighbourhoods, and their socioeconomic characteristics. In other words, the results illustrate that the socioeconomic characteristics associated with neighbourhoods did not share maximum variance with any of the demographic characteristics included in this study. The final comparison showed that the results for the 1990s bore little resemblance to the results earlier in the period under study, and this was true for each of the findings described in section 5.4. That is, the persistent race-housing index found in earlier decades was not reproduced in the 1990s, the concentration of multiple and varied forms of disadvantage loading on the poverty-related index appears to have declined by the 1990s, and the poverty-related index did not load with housing characteristics in the 1990s. Overall, then, the results of Chapter 5 underscore both historical invariance and historical contingency in the types of characteristics that cluster together in Buffalo neighbourhoods.

## 5.5 CONCLUSION

At the beginning of this chapter I indicated that the factor analyses presented above would allow me to determine whether the characteristics that cluster together in Buffalo neighbourhoods demonstrate invariance over time. The results showed that there was a moderate stability in the types of neighbourhood characteristics that intersected in neighbourhoods, particularly in black neighbourhoods, but less stability in the characteristics that clustered in high poverty neighbourhoods over time. Thus, there is evidence of both an historical contingency in shared socioeconomic and housing disadvantages of neighbourhoods, and an historical invariance among neighbourhood characteristics associated with race and racially-specific home ownership.

It is perhaps not surprising that the types of characteristics that overlap most closely in neighbourhoods, as revealed by the factor structures at each decade, would shift over a period when dramatic social and economic transitions were occurring in industrial cities like Buffalo (see Chapter 2). Indeed, the remarkable stability in the race-housing factor from the 1950s through the 1980s, unaccompanied by neighbourhood socioeconomic characteristics at any period, is noteworthy. This comparative finding clarifies that, in Buffalo, the distinction between demographic and socioeconomic characteristics of neighbourhoods is apparent throughout the entire period under study. Black neighbourhoods did exhibit greater socioeconomic difficulties, particularly as the century drew to a close; yet percent black and percent in poverty loaded, during each postwar decade, into different factors, given the particular set of neighbourhood characteristics analysed in this study.

The implications of this analysis are relevant to the explanatory modeling described in the next chapter. First, the multivariate models provided in Chapter 6 are methodologically sound only because the factors produced here eliminate significant multicollinearity across independent variables. More importantly, however, the factor analyses indicate that two variables highly intercorrelated in past research on the spatial distribution of violence across cities – poverty and race – are conceptually and empirically distinguishable in the multivariate analyses of Buffalo homicide presented in the next chapter. It is to examining the neighbourhood characteristics that produce a relocation diffusion of homicide between the 1950s and the 1990s in Buffalo that I now turn.

**TABLE 5.1: Factor Analyses Diagnostics, KMOs and Extracted Communalities by Decade, Buffalo, 1950 to 1990**

1950	KMO	Communality
% Black	.650	<b>.915</b>
% Native Born	.709	<b>.819</b>
% in Poverty	.714	<b>.856</b>
% Non-Owner-Occupied	.684	<b>.841</b>
% Black Owner-Occupied	.660	<b>.893</b>
Overall	.676	

1960	KMO	Communality
% Black	.652	<b>.902</b>
% Native Born	.773	<b>.772</b>
% Males not in LF	.781	<b>.508</b>
% in Poverty	.705	<b>.845</b>
% Non-Owner-Occupied	.759	<b>.834</b>
% Black Owner-Occupied	.619	<b>.838</b>
% Vacant	.885	<b>.770</b>
% Res. Mobile	.822	<b>.739</b>
Overall	.737	

1970	KMO	Communality
% Black	.802	<b>.885</b>
% Native Born	.761	<b>.821</b>
% Males not in LF	.887	<b>.416</b>
% in Poverty	.781	<b>.838</b>
% Non-Owner-Occupied	.773	<b>.853</b>
% Black Owner-Occupied	.732	<b>.790</b>
% Vacant	.794	<b>.810</b>
% Res. Mobile	.710	<b>.625</b>
Overall	.776	

1980	KMO	Communality
% Black	.704	<b>.929</b>
% Native Born	.690	<b>.583</b>
% No High School	.663	<b>.455</b>
% Males not in LF	.889	<b>.729</b>
% Females not in LF	.754	<b>.739</b>
% in Poverty	.886	<b>.865</b>
% Non-Owner-Occupied	.731	<b>.708</b>
% Black Owner-Occupied	.629	<b>.853</b>
% Vacant	.772	<b>.691</b>
Overall	.758	

1990	KMO	Communality
% Black	.649	<b>.809</b>
% No High School	.734	<b>.861</b>
% Males not in LF	.939	<b>.683</b>
% Females not in LF	.821	<b>.891</b>
% in Poverty	.764	<b>.867</b>
% Non-Owner-Occupied	.695	<b>.659</b>
% Vacant	.821	<b>.766</b>
Overall	.774	

**TABLE 5.2: Factor Loadings of Independent Variables for 1950, 1960, and 1970 in Buffalo**

1950		1960		1970		
	F1	F2	F1	F2	F1	F2
% in Poverty	.908		.819		.713	
% Non-Owner-Occupied	.917		.641		.626	
% Black		.793	.897		.914	
% Native Born		.819	.877		.760	
% Black Owner-Occupied		.804	.671		.790	
Eigenvalue*	2.874	1.450				
Model KMO	.676					
			% Black			.846
			% Native Born			.901
			% Black Owner-Occupied			.822
			Eigenvalue*		4.595	1.443
			Model KMO		.776	

Not Included: % Young, % Not in High School,  
 % Males not in LF, % Females not in LF, % Vacant,  
 % Res. Mobile  
 \*Rotated Sum of Squares Eigenvalue

Not Included: % Young, % Females not in LF, % No High School  
 \*Rotated Sum of Squares Eigenvalue

Not Included: % Young, % Females not in LF, % No High School  
 \*Rotated Sum of Squares Eigenvalue



**TABLE 5.2 continued: Factor Loadings of Independent Variables for 1980 and 1990 in Buffalo**

	1980		1990	
	F1	F2	F1	F2
% in Poverty	.807		.665	.652
% No High School	.665		.895	
% Males not in LF	.788		.689	
% Females not in LF	.853		.937	
% Non-Owner-Occupied	.839			.900
% Vacant	.718			.667
% Black		.879		
% Native Born		.755		
% Black Owner-Occupied		.924		
Eigenvalue*	<b>4.777</b>	<b>1.774</b>	<b>4.507</b>	<b>1.029</b>
Model KMO	<b>.758</b>		<b>.774</b>	

Not Included: % Young, % Res. Mobile  
\*Rotated Sum of Squares Eigenvalue

Not Included: % Young, % Black Owner-Occupied,  
% Res. Mobile, % Native Born  
\*Rotated Sum of Squares Eigenvalue

**TABLE 5.3: Majority Black Neighbourhoods (50%+) by Poverty Status, Buffalo**

	N /72	Non Poverty Tracts		Near Poverty <sup>†</sup> Tracts		Extreme Poverty * Tracts		Combined Poverty <sup>†*</sup> Tracts	
		N Majority Black/ All Non Poverty	% Majority Black/ All Non Poverty	N Majority Black/ All Near Poverty	% Majority Black/ All Near Poverty	N Majority Black/ All Extreme Poverty	% Majority Black/ All Extreme Poverty	N Majority Black/ All Poverty Tracts	% Majority Black/ All Poverty Tracts
<b>1950</b>	<b>1</b>	0/4	0	0/54	0	1/14	7.1	<b>1/68</b>	1.5
<b>1960</b>	<b>7</b>	1/60	1.67	4/9	44.4	2/3	66.7	<b>6/12</b>	50
<b>1970</b>	<b>11</b>	4/61	6.56	6/10	60	1/1	100	<b>7/11</b>	63.6
<b>1980</b>	<b>15</b>	2/40	5	9/27	33.3	4/5	80	<b>13/32</b>	40.6
<b>1990</b>	<b>19</b>	<b>1/27</b>	<b>3.70</b>	<b>7/30</b>	<b>23.3</b>	<b>11/15</b>	<b>73.3</b>	18/45	40

† Tracts comprised of 20 percent – 39 percent of residents living below the poverty line

\* Tracts comprised of 40 percent + of residents living below the poverty line

## CHAPTER VI. EXPLAINING THE SPATIAL DISTRIBUTION OF HOMICIDE

In previous chapters, I demonstrated that the spatial distribution of homicide changed over time such that homicide *relocated* across neighbourhoods in Buffalo (see Chapter 4). I also illustrated both an *historical invariance* and an *historical contingency* in the characteristics that cluster together within neighbourhoods (see Chapter 5). Each of the demographic, socioeconomic, and housing characteristics in my analysis has been used to predict variations in the homicide rates of neighbourhoods in prior research. In this chapter, I build on my previous findings to examine four important questions about the nature of homicide in Buffalo neighbourhoods between 1950 and the end of the twentieth century.

In line with past research, the first set of questions investigates the predictors of homicide rates within neighbourhoods. Two questions drive this first set of analyses. First, which neighbourhood characteristics are successful in predicting neighbourhood homicide rates at each of the five postwar decades? Here, I determine the relative importance of various neighbourhood features in producing violence. Particular attention is directed at the impact of the poverty-related and race-housing indices, as high poverty neighbourhoods are distinguishable from black neighbourhoods in Buffalo across each of the five decades. Second, do the characteristics that are important for predicting neighbourhood homicide rates vary across the five time periods? In effect, I examine whether there is stability in the predictors of neighbourhood homicide rates in Buffalo. The second set of questions is directed at examining how the characteristics of neighbourhoods predict membership in 'high homicide rate neighbourhood clusters' (hereafter referred to as *high rate clusters*). These novel analyses use a multivariate

modeling strategy to explain the results generated from the Exploratory Spatial Data Analyses undertaken in Chapter 4. Two questions drive this second set of analyses. First, which neighbourhood characteristics are successful in predicting membership in high rate clusters? If a diffusion effect is responsible for the clustering of homicide in contiguous neighbourhoods, then an analysis of the predictors of membership in high rate clusters will, in effect, identify the types of neighbourhoods that are vulnerable to the diffusion of homicide. This approach provides a unique contribution to the literature on neighbourhoods and crime such that I focus on explaining *where* diffusion is likely to occur, rather than identifying only that it does. Second, do the characteristics that are important for predicting membership in high rate clusters vary across the five time periods? An answer to this question will help to clarify the causes of the *relocation diffusion* of homicide across Buffalo neighbourhoods in the postwar period.

Chapter 6 is organized as follows. In the first section, I provide a short literature review outlining previous research findings on the characteristics that predict variation in neighbourhood homicide rates. I also describe the renewed interest in spatial effects on neighbourhood homicide rates. The literature review closes with discussions of how I extend this research by examining the predictors of high rate neighbourhood clusters. I then outline the various methodologies I use in these analyses, followed by a discussion of the results. I find that poverty and related disadvantages in neighbourhoods increase both internal homicide rates and vulnerability to the diffusion of homicide. The effects of the race-housing factor, however, are more varied. The results suggest that, over time, black neighbourhoods in Buffalo have become increasingly spatially disadvantaged such

that they are vulnerable to diffusion of violence from nearby violent neighbourhoods. The implications of these results are discussed more fully at the end of the chapter.

## 6.1 LITERATURE REVIEW

The recent resurgence of interest in neighbourhood effects on crime and violence has prompted researchers to consider both internal characteristics of neighbourhoods, such as poverty rate, and extra-local influences, such as violence in contiguous neighbourhoods, on neighbourhood homicide rates (Bursik and Grasmick 1993; Sampson, Morenoff and Gannon-Rowley 2002). Drawing on Geographic Information Systems (GIS) and explanatory spatial regression methodologies, this research consistently finds that both within-neighbourhood characteristics *and* the location of neighbourhoods within the social ecology of the city are important predictors of neighbourhood violence. As such, this literature acknowledges the necessity of viewing neighbourhoods in their appropriate social ecological context, rather than as individual units unaffected by their geographic proximity to adjoining areas.

In this section, I first provide synopsis of the state of the literature on the internal predictors of neighbourhood homicide rates. I then examine how recent studies that explicitly incorporate space into explanatory models have arrived at some important conclusions about how the ecological context in which neighbourhoods are embedded influences rates of violence within neighbourhoods. I also summarize the variety of interpretations that have been used to explain the presence of a spatial effect, the most notable being the diffusion of violence. Finally, I outline a general argument and analytic strategy for extending this emphasis on space by explicitly incorporating the ecological

context of the dependent variable, homicide rates, into an examination of neighbourhoods and violence. That is, I argue that the current preoccupation with the effects of geographic proximity to homicide predicting within-neighbourhood homicide rates needs to be broadened to examine how other within-neighbourhood characteristics predict an explicitly spatial dependent variable – the clustering of high homicide neighbourhoods.

### **6.1.1 Predictors of Neighbourhood Homicide**

Scholarly interest in neighbourhood effects has a very long history, and has produced a series of substantively important and reasonably consistent “facts” about how neighbourhoods matter for a variety of health- and crime-related outcomes (Brooks-Gunn et al. 1997a, 1997b; Mayer and Jencks 1989; Sampson et al. 2002; Small and Newman 2001). In a summary article on the role of neighbourhood effects, Sampson et al. (2002: 446) list among these facts a “...considerable social inequality among neighborhoods in terms of socioeconomic and racial segregation” affecting a variety of social outcomes, including neighbourhood rates of violence. Indeed, one of the most consistent findings in this literature is that extreme poverty is strongly associated with violence in urban areas, independent of a variety of control variables (Hannon 2005; Krivo and Peterson 1996; Land et al. 1990; Parker and Pruitt 2000; Shihadeh and Shrum 2004; Wacquant and Wilson 1989).

Neighbourhoods distinguished by poverty are, according to Wilson (1987), uniquely exposed to an array of criminogenic influences both as a function of their absolute deprivation, and as a function of their relative deprivation (Blau and Blau 1982). The post-industrial transition to a service-based economy and the trend toward increased suburbanization during the 1970s and 1980s resulted in a host of problems for residents

of poverty-stricken, inner city neighbourhoods in the U.S. Chief among them were increases in social isolation from mainstream society and mounting concentrated disadvantage (Sampson and Wilson 1995; Wilson 1987; Wacquant and Wilson 1989). A strong and consistent finding in neighbourhood-level research shows that neighbourhoods experiencing socioeconomic disadvantage are neighbourhoods with high violence rates (Anderson 1999; Bourgois 2003; Bursik and Grasmick 1993; Kornhauser 1978; Sampson and Groves 1989). Moreover, the higher the concentration of poverty in the neighbourhood, the higher the homicide rate (Hannon 2005; Krivo and Peterson 1996).

A number of studies focus on the link between socioeconomic disadvantage and the racial composition of neighbourhoods, in part because the most disadvantaged neighbourhoods in contemporary American cities tend to be largely African American, and in some cases Latino/a<sup>76</sup> (Krivo and Peterson 1996; Krivo et al. 1998; Parker and Pruitt 2000; Sampson and Wilson 1995; Shihadeh and Shrum 2004; Wilson 1987). Sampson and Wilson (1995) show that blacks and whites in America live in very different ecological contexts, with poor blacks being five times more likely to live in high poverty neighbourhoods than poor whites.<sup>77</sup>

---

<sup>76</sup> Martinez (2002) shows that while the poorest Latino/a neighbourhoods share similar levels of socioeconomic disadvantage as the poorest African American neighbourhoods, rates of violence in Latino/a neighbourhoods are lower, on average. As such, there is a growing concern with distinguishing between minority-dominated communities (Lee et al. 2001; Martinez 2002; Lee 2003). However, minority neighbourhoods in Buffalo are largely African American neighbourhoods. For instance, in the 1970s only 15.6 percent of the population was of Hispanic background in the census tract with the largest Hispanic population. In the 1980s, one census tract had an Hispanic population comprising slightly more than one quarter of residents (26.3 percent). By the 1990s, two tracts had Hispanic populations of slightly more than one quarter (25.7 and 27.3 percent respectively), and one tract was 42.8 percent Hispanic. Thus, there were no majority Latino/a neighbourhoods in Buffalo during the period under study.

<sup>77</sup> Indeed, the same argument was articulated by Shaw and McKay (1949: 614) when they stated that ...The important fact about rates of delinquency for Negro boys is that they, too, vary by type of area. They are higher than the rates for white boys, but it cannot be said that they are higher than rates for white boys in comparable areas, since it is impossible to reproduce in white communities the circumstances under which Negro children live.

The different ecological contexts of racial groups form the basis of what has been called the racial invariance hypothesis. This hypothesis stipulates that differences in neighbourhood crime rates are attributable to differences in social structural characteristics, not racial composition (see Peterson and Krivo 2005). Yet because race is highly associated with socioeconomic disadvantage in neighbourhoods, higher crime rates are associated with minority neighbourhoods. Recent evidence provides support for the racial invariance hypothesis (Krivo and Peterson 1996; McNulty 2001; Morenoff et al. 2001; Shihadeh and Shrum 2004). Thus, racial segregation into extremely disadvantaged communities may explain why minority neighbourhoods exhibit higher rates of crime and violence (Massey and Denton 1993).

In Land et al.'s (1990) meta-analysis of the structural characteristics that affect homicide across space,<sup>78</sup> a consistent finding emerging from their empirical analysis and their overview of past research is that both socioeconomic disadvantage and the racial composition of geographic areas affects homicide rates. Land and colleagues (1990) consistently find that percent black loads on the same factor as poverty and a number of other variables purported to represent 'resource deprivation.' They justify the inclusion of percent black on a factor with other economic variables (percent living below the poverty line, the Gini index of income inequality, and median family income) and a measure of family structure (percentage of children 18 and under not living with both parents) as being consistent with Wilson's (1987) thesis. That is, economic and social indicators of disadvantage have become increasingly concentrated in inner city neighbourhoods as a function of residential segregation, the decline of manufacturing,

---

<sup>78</sup> Recall that the geographic units in Land et al's (1990) study are cities, SMSAs, and states. They do not focus on neighbourhoods.



and historical discrimination. Therefore, racial composition and socioeconomic status are heavily intertwined at the aggregate-level. Overall, the neighbourhood effects literature has identified a host of disadvantages that combine to inhibit effective social controls against crime and violence in the poorest urban neighbourhoods. Among these, both socioeconomic disadvantage and racial composition have been found to be durable predictors (with regard to racial composition, some argue, spuriously) of violence rates.

### **6.1.2 The Importance of Space**

While the neighbourhood effects research discussed above describes the context in which violence occurs as being an important consideration, the analyses on which that research is based examine how within-neighbourhood characteristics influence within-neighbourhood homicide rates. However, contiguous neighbourhoods can expose one another to violence. In other words, the location of neighbourhoods in urban space matters.

Indeed, the notion that space matters is implied in one of the ‘facts’ of neighbourhood-level research offered by Sampson et al. (2002). They argue that there is “...strong evidence on the connection of *concentrated* disadvantage with the *geographic isolation* of African Americans” (Sampson et al. 2002: 446, *emphasis added*). Implicitly, then, they are arguing that the characteristics of adjoining neighbourhoods help to produce a distinctive social structural milieu in which severely distressed neighbourhoods are embedded. Said differently, disadvantaged neighbourhoods are isolated, in part, because the surrounding neighbourhoods *also* lack employment opportunities and social institutions that are the basis of social organization and social control.

Accounting for the role of geography in producing neighbourhood effects has been accomplished in the literature through the use of spatial econometric modeling. Research shows that both violence, and the neighbourhood characteristics that predict violence, are non-randomly clustered in space (Anselin et al. 2000; Messner et al. 1999). Perhaps more importantly, numerous studies have found that the non-random clustering of violence is *not* fully accounted for by the non-random clustering of poverty and other predictor variables, nor is it accounted for by the non-random clustering of unmeasured independent variables. Instead, "...homicide events in one place actually increase the likelihood of homicides in nearby locales" (Baller et al. 2001: 567).<sup>79</sup>

The typical interpretation of such an effect is that it represents some process of diffusion of violence across space. That is, neighbourhoods that are geographically proximal to neighbourhoods with high rates of violence are themselves at increased risk of violence. However, as Baller et al. (2001) note, diffusion is only indirectly implied by the presence of a spatial effect. The actual 'vector of transmission' is an unobserved process. It may be produced by the subcultural transmission of attitudes favourable to violence across geographic boundaries (Baller et al. 2005), by a propagation of gun usage in neighbourhoods bordering more violent areas (Blumstein 1995; Griffiths and Chavez 2004), and/or by the influence of drug markets or gang rivalries (Cohen and Tita 1999), for example. Whatever the vector of transmission, the presence of a spatial lag effect suggests that homicide in contiguous areas influences neighbourhood homicide rates, over-and-above within-neighbourhood demographic, socioeconomic, and housing characteristics. The consistency with which space matters for predicting violence in

---

<sup>79</sup> This is true to the extent that a spatial lag model is required to account for spatial dependence in the data. A technical discussion of the spatial lag model is provided in section 6.2.1.

America, at various levels-of-analysis, suggests that extra-local factors are important for explaining the distribution and spread of homicide.

### **6.1.3 The Importance of ‘Neighbours’: Homicide Clusters**

In a sense, then, researchers are beginning to seriously incorporate the concept of geographic space, or the social ecology of cities, to not only describe *where* violence happens in urban areas, but to explain *why* violence happens where it does. This interest in geographic space coincided with a growing awareness of ‘concentration effects’ described in Wilson’s (1987) influential monograph. For instance, Krivo et al. (1998) show that between 1980 and 1990, both whites and African Americans experienced neighbourhood contexts composed of increasing concentrations of poverty and female-headed households (see also Jargowsky 1997). They further show that this concentrated disadvantage is markedly higher for blacks than it is for whites.

Krivo et al.’s (1998) study is an example of a larger literature that operationalizes concentrated disadvantage in terms of the proportion of individuals living below the poverty line who reside in the same census tract. Neighbourhoods characterized by “extreme” or “concentrated” poverty are defined as having at least 40 percent of their residents living in poverty (Jargowsky 1997; Krivo and Peterson 1996; Wacquant and Wilson 1989; Wilson 1987). Note, however, that while this measure does distinguish neighbourhoods with high concentrations of poor residents, it does not assume anything about the location of extreme poverty neighbourhoods relative to one another.

In an innovative departure from treating concentrated poverty as a within-neighbourhood variable, Stretesky et al. (2004) provide an analysis of “poverty clustering” that distinguishes cities by a spatially relevant variable – the proportion of

contiguous high poverty census tracts within cities. While the authors found no direct effect of poverty clustering on homicide,<sup>80</sup> they discovered an important interaction effect between poverty clustering and disadvantage. That is, the effect of disadvantage on violent crime was significantly stronger in cities with larger proportions of contiguous poverty-stricken tracts, or 'poverty clusters.'

The extant literature shows that researchers are beginning to concern themselves with delineating and measuring ecological effects in neighbourhood-level research. To date, however, extra-local factors such as the violence experienced by adjoining neighbourhoods have been incorporated to explain a purely within-neighbourhood dependent variable – neighbourhood homicide rate. Alternatively, Stretesky et al.'s (2004) sophisticated measure of poverty clustering *across* tracts, rather than *within* tracts, was used to predict citywide homicide rates. What has escaped the attention of researchers is an analysis of the clustering of high homicide neighbourhoods within cities.

The importance of such a study lies in an inherent question raised by the assumptions of spatial analyses. That is, when a spatial lag is detected in the data, the appropriate assumption is that some sort of diffusion process is responsible for such an effect. If the homicide rates of adjacent neighbourhoods influence the homicide rate within a neighbourhood, controlling for both internal predictors of violence and the clustering of those internal predictors across tracts, then the logical interpretation is that neighbouring violence has a *direct* influence on within-neighbourhood violence though

---

<sup>80</sup> A weak negative effect ( $p \leq 0.05$ ) of poverty clustering on citywide homicide rates is evident when the authors used a poverty threshold of 30 percent living below the poverty line. No main effect was found in the models conceptualizing extreme poverty tracts as those with 40 percent or more living below the poverty line (Stretesky et al 2004).

some process of transmission across neighbourhood boundaries. This contagion of homicide through exposure to violence in adjoining neighbourhoods makes intuitive sense. However, if a contagious diffusion of homicide is responsible for the transmission of violence across space, then we might expect to see this diffusion spread outward ad infinitum. Yet it does not.<sup>81</sup>

In an exploratory analysis of the spatial distribution of homicide across counties in St. Louis, Messner et al. (1999) find that affluent counties can serve as a barrier to the diffusion process. However, apart from their exploratory analysis, we do not yet know which internal characteristics make neighbourhoods vulnerable to the diffusion of violence from surrounding areas. The analyses of high homicide rate neighbourhood clusters that I present below fills this important gap in the literature on the concentration and spatial distribution of violence in urban areas.

## 6.2 METHOD

Two separate sets of analyses are conducted in this chapter; one aimed at examining the neighbourhood characteristics that predict within-neighbourhood homicide rates, and one aimed at examining the neighbourhood characteristics that predict membership of neighbourhoods in high rate clusters. I use Ordinary Least Squares regression (OLS) and Two-Stage, Least Squares spatial regression methods to predict neighbourhood homicide rates in the first set of analyses. For the second set of analyses, I use multinomial logit regression to predict membership of neighbourhoods in high and

---

<sup>81</sup> Recall Figure 4.16 (in Chapter 4) shows that a cluster of high-high tracts is apparent in Buffalo at each of the five decades; the cluster incorporates between seven and 12 tracts at each time point. It does not include additional tracts at each decade, without losing some that had been defined as high-high tracts in previous decades. Indeed, this is the basis on which I proposed that a *relocation diffusion*, and not an *expansion diffusion*, of homicide happened in Buffalo.

low rate clusters as a function of the same neighbourhood characteristics. Each methodological strategy is detailed below.

### 6.2.1 Predicting Neighbourhood Homicide Rates

In the first stage, I use OLS regression techniques to assess the relative influence of each of the independent variables and factor indices on neighbourhood homicide rates at each decade. Given the clear spatial clustering of both the dependent and the independent variables across the city (see Figures 4.16 to 4.28), it was important to examine diagnostics for multicollinearity, heteroskedasticity, and spatial dependence in these models.<sup>82</sup> Finding evidence of spatial autocorrelation in the data indicate that the assumption of independence of errors required for OLS regression is violated, and failure to account for this autocorrelation will result in biased and inefficient coefficients. It is thus important to assess whether spatial autocorrelation is present, and whether it represents a nuisance to be controlled (spatial error) or a substantive effect on the dependent variable (spatial lag).

To accomplish this goal, I first created a spatial weights matrix ( $W_{ij}$ ). Spatial autocorrelation can only be detected by examining the non-random patterning of 'neighbours' in a spatial weights matrix,  $W_{ij}$ .  $W_{ij}$  is a row-standardized square matrix with each row and each column corresponding to the number of observations in the dataset. In the case of Buffalo census tracts,  $W_{ij}$  is a 72 x 72 matrix. Each element,  $w_{ij}$ , of  $W_{ij}$  is non-zero if tracts  $i$  and  $j$  are neighbours. In constructing the spatial weights

---

<sup>82</sup> These diagnostics are provided in the model estimation output using SpaceStat 1.80 (Anselin 1995).

matrix for these analyses, I identified tracts as neighbours if they shared a common boundary.<sup>83</sup>

Spatial diagnostics are provided in the form of Moran's I, Lagrange Multiplier, and Robust Lagrange Multiplier statistics following the OLS regression results at each decade. These tests indicate whether spatial autocorrelation represents a problem for the model, and moreover, what type of spatial autocorrelation is present in the data. Error dependence suggests that the identified spatial autocorrelation is a nuisance that can be removed from the error term of the regression equation to provide more efficient estimates of the coefficients. On the other hand, lag dependence signifies an important spatial effect representing the influence of the average of neighbouring homicide rates on each neighbourhood's internal homicide rate. While this extra-local effect is substantively important, it is also methodologically important. Anselin et al. (2000: 241) argue that "...ignoring lag dependence is the more serious offense, since, as an omitted variable problem, it results in biased and inconsistent estimates for all coefficients in the model; and the inference derived from these estimates is flawed." Regression models for aggregate units-of-analysis such as neighbourhoods should routinely include an assessment of spatial diagnostics because failure to do so may result in model misspecification.

Where these spatial diagnostics indicate that spatial autocorrelation is present, I use a Two-Stage, Least Squares spatial regression modelling strategy. In the first stage, an instrumental variable is created to capture the predicted values of neighbouring

---

<sup>83</sup> This is the "rook" criterion for defining neighbours. Under this criterion, a value of 1 is assigned to  $i$  and  $j$  only if they share some length of a common boundary. Other criteria on which to define spatial weights matrices include the "queen" criterion wherein tracts need only meet at a point to be identified as neighbours, as well as a variety of distance-based criterion (Anselin 1988). The rook criterion is commonly used in neighbourhood-level research.

homicide rates and in the second stage internal neighbourhood homicide rates are regressed on these predicted values, in addition to the remaining independent variables and factor indices described in Chapter 5. The results of the models for each decade are provided in section 6.3.1.

### **6.2.2 Predicting Neighbourhood Clusters**

In the second set of analyses for this chapter, I use multinomial logit regression analyses to predict membership in high and low rate clusters at each decade. Multinomial logit regression is a maximum likelihood technique employed when the dependent variable is categorical. Using the results of the Exploratory Spatial Data Analysis presented in Chapter 4, I created a three-category dependent variable for each period. I operationalized the dependent variable using the Local Indicators of Spatial Autocorrelation (LISA) statistics generated from the Moran Scatterplot maps.

Recall that the Moran Scatterplot maps for homicide rates across the five decades (Figure 4.16) graphically distinguished neighbourhoods by the direction and significance of the LISA statistics. Table 6.1 provides frequency distributions of tracts based on the LISA statistics generated in Figure 4.16. For instance, in the 1950s, seven neighbourhoods were defined as ‘high-high’ neighbourhoods, which means that those seven neighbourhoods had significantly high homicide rates and were bordered by neighbourhoods that also had significantly high homicide rates. Three neighbourhoods were defined as ‘low-low’ clusters in the 1950s, and the remaining 62 neighbourhoods were identified as either ‘high-low’ (N=1), ‘low-high’ (N=1) or non-significant (N=60).<sup>84</sup> The dependent variable for these analyses, then, compares both ‘high-high’ and ‘low-

---

<sup>84</sup> The very few neighbourhoods exhibiting negative local spatial autocorrelation (i.e. high-low or low-high) prevented separate categorization in the multinomial models.



low' neighbourhoods (alternatively, high rate and low rate neighbourhood clusters) to all other tracts in the city.

To my knowledge, analyses such as these have not been attempted in published research to date, and yet the implications of such analyses are important for at least two reasons. First, if the geographic location of neighbourhoods in cities matters for producing within-neighbourhood rates of violence, then it is reasonable to question whether the neighbourhood characteristics that predict membership in high rate clusters are distinct from the characteristics that predict neighbourhood homicide rates. Living in a violent neighbourhood that is surrounded by other violent neighbourhoods may be qualitatively different from living in a violent neighbourhood that is not similarly surrounded. By analysing membership in high rate clusters, I treat 'neighbourhood context' as a concept that extends across urban neighbourhoods and that incorporates the social ecology of the city.

Second, clarifying the features of neighbourhoods that increase their vulnerability to a diffusion of violence across local boundaries may lead to important policy implications for law enforcement and urban planners. The implications of such analyses could provide the tools necessary to assess the vulnerability of neighbourhoods on the fringes of violent hotspots, target relevant resources to those areas based on empirical knowledge about where diffusion is likely to occur, and potentially contain the spread of urban violence.

## 6.3 RESULTS

### 6.3.1 Predictors of Neighbourhood Homicide Rates

Following Land et al. (1990), I use untransformed neighbourhood homicide rates as the dependent variable for the first five models.<sup>85</sup> After inspection of the spatial diagnostics, OLS models for the 1960s, 1970s, 1980s, and 1990s all suggested the presence of a spatial lag.<sup>86</sup> For each of these four decades, a Two-Stage, Least Squares model incorporating a spatial lag of neighbouring homicide rates was appropriate. The results of, and a comparison across these five models are provided in Table 6.2.<sup>87,88</sup>

---

<sup>85</sup> The presence of a substantial density of zeros for neighbourhood homicide rates means that they do not exhibit a bell-shaped curve at any of the decades under examination. There is no simple transformation that can be used to create a bell-shaped curve from this type of distribution. However, the assumption of normality in least squares regression pertains to the residuals, not to the dependent variable. Histograms of residuals for all five decades are relatively normally distributed. In addition, while the sample size in these models is small ( $N=72$ ), the number of independent variables included in each model is similarly small (between 5 and 7) suggesting that the central limit theorem is likely to hold (Allison 1999). Thus, the results presented in this chapter regress untransformed neighbourhood homicide rates on the independent variables.

<sup>86</sup> In the 1950s model, the initial spatial statistic (e.g., Moran's I (error)) was barely significant with a  $p$  value of 0.044. The Lagrange Multiplier and Robust Lagrange Multiplier tests for error and lag dependence, however, were all non-significant. This suggests that spatial dependence was not present in the 1950s OLS model. To ensure that there were no problems with the efficiency of the estimates in the 1950s data, I ran a general moments estimation in a spatial error model. This is a spatial autoregressive technique based on a series of estimated equations derived from moments of the error terms. A lambda ( $\lambda$ ) coefficient is provided in the output as a nuisance term to remove spatial dependence from the error structure of the equation. Coefficients and standard errors of the independent variables are also provided. Inspection of this model illustrated no differences in magnitude or significance of effects. Moreover, the standard errors were virtually identical to the OLS model. As such, the OLS model is the appropriate model to estimate the 1950s neighbourhood homicide rates.

<sup>87</sup> I added a measure of tract population density at each decade to the models as a control variable in analyses not shown. None of the variables changed in significance or direction of effect. The only model in which population density was significant was the OLS regression of the 1950s homicide rates. To increase the degrees of freedom, I did not include population density as a control variable in any of the models presented in Table 6.2.

<sup>88</sup> In additional analyses not shown, I ran the regression models omitting tracts defined as outliers based on their homicide rate. Four tracts were identified as outliers in the 1950s, 1970s, and 1980s. Five tracts were identified as outliers in the 1960s, and two tracts were identified as outliers in the 1990s. Omission of these tracts did not change the models significantly. In the 1950s, percent vacant became significant and in the 1970s percent young and percent females not in the labour force (both only marginally significant in the results presented in Table 6.2) lost significance. Outliers in this study are *not* a function of poor sample selection given that the total universe of neighbourhoods in Buffalo are included. Thus, I do not omit substantively important variation by removing outliers in these analyses.

### **ORDINARY LEAST SQUARES MODEL FOR THE 1950S**

The results of the Ordinary Least Squares model regressing neighbourhood homicide rate in the 1950s on both the poverty-related and the race-housing factors, as well as on percent young, percent males not in the labour force, percent females not in the labour force, percent not completing high school, and percent vacant are provided in the first column of Table 6.2. The full model explains 53 percent of the variance in neighbourhood homicide rates. Of the independent variables, only the two factor scores significantly affected the homicide rate. The results suggest that a one standard deviation unit increase in the poverty-related factor was associated with a 0.24 per 1,000 population increase in the homicide rate ( $p \leq 0.001$ ). That is, neighbourhoods higher in poverty and exhibiting less owner-occupied housing were neighbourhoods exhibiting higher homicide rates in the 1950s. The model also indicates that a one standard deviation unit increase in the race-housing factor was associated with a 0.32 per 1,000 population increase in neighbourhood homicide rate ( $p \leq 0.001$ ). In the 1950s, black neighbourhoods exhibited proportionately higher homicide rates than did other neighbourhoods in the city.

### **TWO-STAGE, LEAST SQUARES FOR THE 1960S**

The second column of Table 6.2 provides the results of the Two-Stage, Least Squares model regressing 1960s neighbourhood homicide rates on the two factor indices, percent young, percent females not in the labour force, percent not completing high school, and the spatial lag of neighbouring homicide rates. Like the 1950s model, both the poverty-related factor and the race-housing index were positively associated with 1960s neighbourhood homicide rates ( $p \leq 0.001$ ). In addition, the coefficient for the spatial lag was also strongly associated with homicide rates. This effect is interpreted as

follows: an average increase of 1 homicide per 1,000 population among contiguous neighbourhoods was associated with a 0.56 per 1,000 population increase in internal neighbourhood homicide rates in the 1960s ( $p \leq 0.001$ ), controlling for other important within-neighbourhood characteristics. This model explained 74 percent of the variance in neighbourhood homicide rates.

#### **TWO-STAGE, LEAST SQUARES FOR THE 1970S**

A Two-Stage, Least Squares model regressing 1970s neighbourhood homicide rates on the poverty-related factor, the race-housing index, percent young, percent females not in the labour force, percent not completing high school, and the spatial lag of neighbouring homicide rates is provided in the third column of Table 6.2. This model explained 76 percent of the variance in neighbourhood homicide rates. Again, both the poverty-related factor and the race-housing factor significantly predicted higher neighbourhood homicide rates in the 1970s ( $p \leq 0.001$ ). Indeed, a one standard deviation unit increase in *either* factor was associated with nearly an additional homicide per 1,000 population. Neighbourhoods with higher proportions of residents under the age of 18 and with higher proportions of females who were not in the labour force had slightly lower homicide rates ( $p \leq 0.05$ ). The effect of the spatial lag was positive and marginally significant suggesting that every additional homicide per 1,000 population averaged across neighbouring tracts was associated with an increase of 0.42 homicides per 1,000 population in neighbourhoods ( $p \leq 0.05$ ). These latter three effects were all significant only at the 0.05 level.<sup>89</sup>

---

<sup>89</sup> While I report these effects as significant, Allison (1999: 131) advises a more conservative use of  $p$  values with smaller sample sizes "...to compensate for the possibility that the computed  $p$  values may only be rough approximations." The possibility of making Type 1 errors, or concluding that an effect is present when it is not, increases when the sample size is small.

### **TWO-STAGE, LEAST SQUARES FOR THE 1980S**

The Two-Stage, Least Squares regression of 1980s neighbourhood homicide rates regresses the dependent variable on the two factor scores created in Chapter 5, percent young, percent residentially mobile, and the spatial lag of neighbouring homicide rates (see column 4, Table 6.2). This model shows only two statistically significant effects. A one standard deviation unit increase in the poverty-related factor was associated with a 0.37 per 1,000 population increase in neighbourhood homicide rates ( $p \leq 0.05$ ). Similarly, an increase of 1 homicide per 1,000 population averaged across neighbouring tracts was associated with an increase of 0.79 homicides per 1,000 population in neighbourhoods, controlling for a variety of internal neighbourhood characteristics ( $p \leq 0.001$ ). The immediately apparent distinction between this model and the models for the three decades preceding it concerns the lack of effect of the race-housing index on neighbourhood homicide rates which can be seen in the 1980s and the 1990s. On the whole, 65 percent of the variance in neighbourhood homicide rates in the 1980s was explained by this model.

### **TWO-STAGE, LEAST SQUARES FOR THE 1990S**

The final column of Table 6.2 provides the results of the Two-Stage, Least Squares model regressing neighbourhood homicide rates in the 1990s on the poverty-related index, the reconfigured<sup>90</sup> race-housing index, percent native born, percent young, percent black owner-occupied housing, percent residentially mobile, and a spatial lag of neighbouring homicide rates. This model explained 72 percent of the variance in neighbourhood homicide rates during the 1990s. The results show that every one

---

<sup>90</sup> Recall that the race-housing index was composed of a different set of variables in the 1990s compared to previous years.

standard deviation unit increase in the poverty-related index was associated with an increase of 0.73 homicides per 1,000 population in neighbourhoods ( $p \leq 0.001$ ). In addition, a 20 percent increase in black owner-occupied housing was associated with an increase of 1.2 homicides per 1,000 population ( $p \leq 0.001$ ). Percent young showed the only other marginally significant effect on neighbourhood homicide rates in the 1990s ( $p \leq 0.05$ ). A 20 percent increase in percent of the population aged less than 18 was associated with an increase of 1 homicide per 1,000 population in Buffalo neighbourhoods.

While the spatial diagnostics for the 1990s OLS model suggested the presence of a spatial lag in the data, the effect of this lag was not significant in predicting internal neighbourhood homicide rates in the Two-Stage, Least Squares model ( $p = 0.09$ ). The proper interpretation of such a non-significant effect is that the clustering of the exogenous neighbourhood characteristics included in the model fully accounts for the observed clustering of neighbourhood homicide rates in Buffalo during the 1990s. Following Baller, Shin, and Richardson (2005), I ran a series of additional spatial lag models incorporating only the spatial lag and each independent variable separately. This allowed me to determine which neighbourhood characteristics were most responsible for the observed spatial clustering of homicide. The results of these reduced models show that percent not completing high school (followed closely by percent females not in the labour force) virtually eliminated the effect of the spatial lag (see Appendix 6.I for a table of the results).<sup>91</sup> Both of these variables strongly cluster in space (see Figures 4.21 and

---

<sup>91</sup> The spatial lag effect is also non-significant in the separate models for percent black, percent in poverty, percent non-owner-occupied housing, percent black owner-occupied housing, and percent residential mobility. However, the model regressing neighbourhood homicide rates on percent not completing high school and the spatial lag of homicide resulted in the smallest spatial lag coefficient.

4.23) and are highly correlated with one another and with neighbourhood homicide rates;<sup>92</sup> in addition, the poverty-related factor encompassing these two variables significantly predicted neighbourhood homicide rates.

### **6.3.2 Predictors of Neighbourhood Clusters**

The results discussed above both describe predictors of homicide rates within-neighbourhoods and illustrate changes in the characteristics that predict neighbourhood homicide rates in different decades. However, apart from including (where relevant) a spatial lag of neighbouring homicide rates, the results above do not consider how the characteristics of neighbourhoods comprising statistically significant clusters of violence may differ from those predicting internal homicide rates alone. In this section, I review the results of a series of multinomial logit regression analyses predicting membership in high and low homicide rate clusters of neighbourhoods relative to all others. I provide separate tables of multinomial logit results for each decade alongside the results of the models predicting within-neighbourhood homicide rates from Table 6.2. The multinomial logit models do not include a spatial lag of neighbouring homicide rates because the importance of extra-local patterns of violence is explicitly captured in the three-category dependent variable.

#### **MULTINOMIAL LOGIT MODEL FOR THE 1950s**

Table 6.3 provides the multinomial logit regression results for the clustering of homicide across neighbourhoods during the 1950s. Recall the 1950s Moran Scatterplot map from Figure 4.16 (see Chapter 4) which showed the presence of a cluster of seven

---

<sup>92</sup> The zero-order correlation coefficients are: 0.496 for percent not completing high school and the homicide rate, 0.406 for percent females not in the labour force and the homicide rate, and 0.811 for percent not completing high school and percent females not in the labour force in 1990 (all significant at  $p \leq 0.01$ ).

neighbourhoods that exhibited high homicide rates and that were contiguous to neighbourhoods that also exhibited high homicide rates (i.e., these tracts are identified in red in Figure 4.16). These neighbourhoods comprise a high rate cluster. Three neighbourhoods at the eastern edge of the city were identified as 'low/low' neighbourhoods (i.e., these low rate clusters of tracts are shaded dark grey in Figure 4.16). The remaining neighbourhoods in the city were defined as insignificant in driving the non-random spatial clustering of homicide, or they exhibited slight negative spatial autocorrelation. These remaining neighbourhoods combined serve as the reference category for the multinomial logit regression discussed here.

The results of a multinomial logit regression predicting membership in the high rate cluster compared to reference neighbourhoods indicate that only one of the neighbourhood characteristics successfully predicted membership. A one standard deviation unit increase in the poverty-related factor increased the odds of being part of the high rate cluster by 10 times. None of the neighbourhood characteristics distinguished between neighbourhoods defined as low rate clusters compared to the reference group. The clustering of high homicide rates during the 1950s was driven largely by the clustering of poverty and non-owner-occupied housing in the downtown and Fruitbelt areas of Buffalo. Contrary to the OLS model predicting internal neighbourhood homicide rates, the race-housing factor did not distinguish high homicide rate clusters of neighbourhoods from other neighbourhoods in the city.

#### **MULTINOMIAL LOGIT MODEL FOR THE 1960S**

The results of the multinomial logit regression for the 1960s are provided in Table 6.4. This model includes only the two factor scores as independent variables. The full



model for the 1960s data showed that there was a quasi-complete separation in the data. This means that a linear combination of the factor scores and at least one of the three independent variables predicted the outcome almost perfectly.<sup>93</sup> I first estimated the 1960s model excluding the two factor scores; none of the three remaining independent variables statistically predicted the outcome and the explained variance of the model was very low (see Appendix 6.II). Therefore, I dropped these variables from the estimation of the model.<sup>94</sup> The results shown here estimate the outcome with the two factor scores only. The reported model has reasonable coefficient and standard error sizes.

A one standard deviation increase in the poverty-related factor increased the odds of a neighbourhood being part of a high rate cluster by 31 times. The race-housing factor was also significant in predicting membership in a high rate cluster; increasing the race-housing index by one standard deviation raised the odds that the neighbourhood would be a member of a high rate cluster by three and a half times. In terms of predicting membership in low rate clusters, only the poverty-related factor negatively predicted membership during the 1960s. That is, a one standard deviation increase in the poverty-related factor reduced the odds of a neighbourhood being part of a low homicide rate cluster by 93 percent.

---

<sup>93</sup> I ran a series of models including and excluding various combinations of variables in an attempt to discern the particular variables that perfectly predicted one another. A quasi-complete separation of the data occurs only when both factor indices are included, in addition to either 1) percent females not in the labour force and percent not completing high school or 2) percent young and percent not completing high school. It is a combination of more than two variables creating this linear combination.

<sup>94</sup> There are two other alternative methods of handling quasi-complete separation in the data. The first uses a ridge regression technique that penalizes large coefficients. This technique is rarely employed because the proper interpretation of ridge regression coefficients is unclear (Land et al. 1990). The second method is structural equation modeling which creates factors and simultaneously models the dependent variable. Given the objectives of Chapter 5, structural equation modeling would not sufficiently allow for an examination of the historical invariance or contingency in neighbourhood characteristics. In lieu of these alternative methods, I chose to exclude non-significant variables and model the 1960s data using the same methods as I do for the remaining decades.

### **MULTINOMIAL LOGIT MODEL FOR THE 1970S**

Table 6.5 shows that the only neighbourhood characteristic found to predict membership in both high and low rate clusters in the 1970s was the poverty-related factor. Increasing the poverty-related index by one standard deviation increased the odds of a neighbourhood being in a high rate cluster by 75 times, and decreased the odds of a neighbourhood being in a low rate cluster by 96 percent. None of the remaining variables affected membership in either a high rate cluster or a low rate cluster during the 1970s. These findings differ from those of the Two-Stage, Least Squares model predicting internal neighbourhood homicide rates. While percent young and percent females not in the labour force were only marginally significant in predicting neighbourhood homicide rates during the 1970s, the race-housing index was strongly associated with neighbourhood homicide rates. The race-housing index, however, was not predictive of being a high homicide rate neighbourhood that is contiguous with other high rate neighbourhoods during the 1970s.

### **MULTINOMIAL LOGIT MODEL FOR THE 1980S**

The multinomial logit regression results predicting membership in high and low homicide rate clusters during the 1980s are provided in Table 6.6. These analyses show that both the poverty-related factor and the race-housing factor were important for predicting membership in high and low rate clusters, though in opposite directions. A one standard deviation unit increase in the poverty-related index increased the odds of a neighbourhood being a member of a high homicide rate cluster by four and a half times. By contrast, a one standard deviation unit increase in poverty reduced the odds of a neighbourhood being a member of a low homicide rate cluster by 87 percent. Similarly,

increasing the race-housing index by one standard deviation increased the odds that a neighbourhood would be part of a high rate cluster by 5.7 times. The same increase in the race-housing index reduced the odds of a neighbourhood being a member of a low homicide rate cluster by 96 percent. Contrary to the Two-Stage, Least Squares model predicting internal neighbourhood homicide rates in the 1980s, the race-housing index was important for predicting the clustering (or lack thereof) of homicide in Buffalo.

#### **MULTINOMIAL LOGIT MODEL FOR THE 1990S**

Table 6.7 provides the results of the multinomial logit models predicting neighbourhood membership in high homicide rate and low homicide rate clusters respectively in the 1990s. The results show that the poverty-related index, which predicted membership in high rate clusters in each of the preceding decades, was no longer significant in predicting high rate cluster membership during the 1990s. It did, however, predict membership in low rate clusters such that a one standard deviation unit increase in the poverty-related index reduced the odds of a neighbourhood being in a low rate cluster by 96 percent. The race-housing index was predictive of neighbourhood membership in the high homicide rate cluster. A one standard deviation unit increase in the race-housing index increased the odds of a neighbourhood being part of a high rate cluster by more than six times. The race-housing index had no effect on membership in the low rate clusters. These findings are at odds with the results of the Two-Stage, Least Squares regression predicting within-neighbourhood homicide rates, wherein the poverty-related factor, percent young, and percent black owner-occupied housing were associated with neighbourhood homicide rates, but the race-housing index was not. A thorough discussion of the comparisons across models and decades is provided in the next section.

## **6.4 DISCUSSION**

I began this chapter by outlining two sets of questions that my analyses are intended to address. The first set of questions asks which characteristics influence the internal homicide rates of Buffalo's neighbourhoods, and whether the predictors of neighbourhood homicide rates changed between the 1950s and the 1990s. The second set of questions reiterates those same queries, except that I focus on the predictors of high rate clusters of neighbourhoods. In the following sections, I compare and contrast the results of the various models to answer these questions and draw conclusions about how and why the spatial distribution of homicide changed in Buffalo.

### **6.4.1 Predicting Neighbourhood Homicide Rates**

The OLS and Two Stage, Least Squares models regressing internal neighbourhood homicide rates on various demographic, socioeconomic, and housing characteristics of Buffalo's neighbourhoods are summarized in Table 6.2. The results of these models are consistent with studies in other cities, and at other levels-of-analysis, in the sense that the poverty-related factor was strongly related to internal homicide rates at each of the decades under examination. Disadvantaged neighbourhoods in Buffalo exhibited significantly higher rates of homicide, controlling for a host of neighbourhood characteristics in addition to levels of homicide in neighbouring areas. This stable and consistent finding is not unexpected.

The results show, however, variation in the influence of the race-housing factor on homicide rates within neighbourhoods over time. Unlike most other cities that have been the focus of neighbourhood-level research, black neighbourhoods in Buffalo are not

synonymous with poverty-stricken neighbourhoods.<sup>95</sup> According to the results of my analyses, this race-housing factor was associated with neighbourhood homicide rates during the 1950s through the 1970s, but not in the 1980s and 1990s.<sup>96</sup> Thus, the racial invariance hypothesis, which claims that the effect of racial composition on violence rates is largely spurious due to the strong relationship between race and socioeconomic disadvantage, is supported in Buffalo, but only in the later decades. That is, once socioeconomic disadvantage is controlled in the multivariate models for the 1980s and 1990s, black neighbourhoods do not have higher homicide rates than white neighbourhoods.<sup>97</sup> In the earlier decades, however, black neighbourhoods were associated with higher homicide rates, controlling for poverty and related disadvantages.

The implications of this finding need to be considered within the historical backdrop of the period. Figure 4.18 showed that the relatively small black population living in Buffalo in the 1950s and 1960s was residentially segregated in the downtown and Fruitbelt corridor immediately east of downtown. Using the Index of Dissimilarity<sup>98</sup>

---

<sup>95</sup> An exception is Krivo and Peterson's (1996) study of extremely disadvantaged neighbourhoods in Columbus, Ohio. In Columbus, both blacks and whites inhabit high poverty neighbourhoods. Columbus is also similar to Buffalo to the extent that both were industrial cities, both have suffered economic setbacks with the shift to a post-industrial economy, and both cities have witnessed a dramatic population decline since the 1950s.

<sup>96</sup> Recall that the results of the factor analyses performed in Chapter 5 showed that a stable race-housing factor (comprised of percent black, percent black owner-occupied housing, and percent native born) distinguished Buffalo neighbourhoods from the 1950s through the 1980s. By the 1990s, the race-housing factor was modified to include only percent black, percent non-owner-occupied housing, and percent vacant.

<sup>97</sup> Note that the variable measuring percent black owner-occupied housing is a significant predictor of homicide rates in Buffalo during the 1990s. This finding suggests some caution should be taken in asserting full support for the racial invariance hypothesis in later decades. Nonetheless, the lack of a significant effect of racial composition (and accompanying characteristics on the race-housing index) does signify an important modification of the predictors of neighbourhood homicide rates in different decades.

<sup>98</sup> The equation for the Index of Dissimilarity is:

$$D_{bw} = \sum_{j=1}^n \left| \left( \frac{b_j}{B} \right) - \left( \frac{w_j}{W} \right) \right|$$

where  $b_j$  and  $w_j$  are the numbers of blacks and whites in tract  $j$ ,  $n$  is the number of tracts in the city, and  $B$  and  $W$  are the total numbers of blacks and whites in the city (Massey and Eggers 1990, 1993).

proposed by Massey and Eggers (1990, 1993), I computed the percentage of the black (or white) population who would need to change residential tracts to achieve perfect integration. The Index of Dissimilarity ranges from 0 to 100 with 0 signifying complete integration and 100 signifying complete racial segregation. Buffalo is what Massey and Denton (1993) refer to as a 'hypersegregated' city with an Index of Dissimilarity score of 82.5 percent in the 1950s. Segregation increased slightly to a score of 84.5 percent in the 1960s before declining marginally to 81.0 percent in the 1970s, 74.0 percent in the 1980s, and 71.5 percent in the 1990s.

As the hypersegregation by race in Buffalo slowly declined over time, the black population was able to expand into neighbourhoods that had lower homicide rates. Note that this expansion diffusion of the black population into a larger number of neighbourhoods on the East Side (see Figure 4.18) coincided with a relocation diffusion of homicide across a much smaller cluster of neighbourhoods. This, coupled with the finding that over the same period the influence of the race-housing index on internal neighbourhood homicide rates declined in significance, provides support for the racial invariance hypothesis. That is, in the immediate postwar period, the race-housing index predicted higher neighbourhood homicide rates because, in some sense, the black population of Buffalo was trapped by housing options into a small group of neighbourhoods close to the downtown core. Once racial residential segregation began to diminish, the race-housing index was no longer associated with internal neighbourhood homicide rates.

In a majority of the decades studied here, there is a direct effect of homicide rates in adjacent neighbourhoods on homicide rates within a neighbourhood. This positive and

significant spatial lag effect for the 1960s, 1970s, and 1980s<sup>99</sup> indicates that violence in neighbouring areas influences neighbourhood homicide rates, controlling for their internal demographic, socioeconomic, and housing characteristics. These results suggest, then, that the geography of the city in the form of proximity to violent neighbourhoods is important for producing a diffusion of violence across space.

Given that geographic proximity to violent neighbourhoods directly influences neighbourhood homicide rates, and evidence of a relocation diffusion of homicide across the five decades in Buffalo, I argue that it is necessary to examine whether there are particular characteristics within neighbourhoods that make them more vulnerable to the diffusion of homicide. I pursue this issue in the analyses predicting membership of neighbourhoods in high homicide rate clusters.

#### **6.4.2 Predicting Membership in High Rate Clusters**

To aid in comparing across the multinomial regression results for each of the five decades, Table 6.8 summarizes the results of the ‘high-high’ columns provided in Tables 6.3 to 6.7. These analyses predicted the membership of neighbourhoods in high homicide rate clusters between the 1950s and the 1990s. Recall from Figure 4.16 that the cluster of neighbourhoods defined as having high internal rates of homicide, in addition to bordering neighbourhoods that also have high rates of homicide, relocated from the downtown core in the 1950s further east into the Ellicott and Masten districts by the end of the century. Because the particular neighbourhoods that comprise the high rate cluster change over time, an analysis of this sort allows me to identify the characteristics of neighbourhoods that made them vulnerable to inclusion in the high rate cluster. As such,

---

<sup>99</sup> A spatial lag is also found in the 1990s data, yet this effect does not reach significance in the Two Stage, Least Squares model.

the results of these analyses begin to establish the causes of the relocation diffusion of homicide that occurred across Buffalo neighbourhoods.

The poverty-related factor distinguished neighbourhoods in high rate clusters from other neighbourhoods in the city for each decade, save the 1990s. Poverty and related disadvantages had the largest influence on membership in high rate clusters; increases in this index raised the odds of being in a high rate cluster by 10, 31, and 75 times for the 1950s, 1960s, and 1970s respectively. By the 1980s, however, while the poverty-related factor was associated with membership in high rate clusters, the relative effect was much smaller and was surpassed by the race-housing index, which was the most important predictor in the model.

A cursory examination of the influence of the race-housing index on high rate clusters indicates that black neighbourhoods became more vulnerable to the relocation diffusion of homicide over time. While a marginally significant effect of the race-housing index is apparent during the 1960s, the influence of this variable is undeniable by the 1980s and 1990s. In both later decades, a one standard deviation increase in the race-housing index increases the odds of membership in a high rate cluster by approximately six times. Moreover, by the 1990s it is the *only* factor in the model to affect neighbourhood membership in a high rate cluster.

While there was evidence for an increasing racial invariance in the neighbourhoods that experienced high internal homicide rates over time in Buffalo, the results of the multinomial logit analyses suggest that there is less racial invariance in the vulnerability of neighbourhoods to membership in high homicide rate clusters. Table 6.8 shows that the race-housing index became an increasingly important predictor of



membership in high homicide rate clusters. This finding indicates that black neighbourhoods, independent of their socioeconomic characteristics, were more vulnerable to inclusion in high rate clusters than were white neighbourhoods. The precariousness of black neighbourhoods to inclusion in high rate clusters is consistent with Patillo-McCoy's (1999) assertion that middle-class black neighbourhoods are spatially disadvantaged such that they often border more disadvantaged areas, and serve as a buffer to middle-class white neighbourhoods. My analyses confirm that a similar process is at work in Buffalo between the 1950s and the 1990s.

#### **6.4.3 A Comparison between Neighbourhood Homicide Rates & Membership in High Rate Clusters**

A comparison of the results predicting internal neighbourhood homicide rates to those predicting membership of neighbourhoods in high rate clusters provides some important clues about the utility of examining homicide in a way that incorporates the social ecology of the city. It was only during the 1960s that the results predicting neighbourhood homicide rates were identical to the results predicting membership in high rate clusters (see Table 6.4). During the 1960s, both neighbourhoods with higher poverty-related factor scores and neighbourhoods with higher race-housing factor scores exhibited higher rates of homicide and were likely to be surrounded by other neighbourhoods exhibiting significantly higher homicide rates compared to the remainder of the city.

Potentially more important are the findings from the 1950s, 1970s, 1980s, and 1990s. Comparisons across these models show that the predictors of high rates of homicide within neighbourhoods are not identical to the predictors of membership in high

rate clusters. What this suggests is that the characteristics that make neighbourhoods vulnerable to diffusion of homicide across their borders are, in some ways, distinct from the characteristics that make neighbourhoods vulnerable to homicide within their borders. Apart from the 1990s, the findings show that higher poverty neighbourhoods are at greater risk of homicide, and are at greater risk of being encompassed in a geographically proximal cluster of neighbourhoods that themselves have a greater risk of homicide (see Tables 6.3 to 6.6). Thus, residents in neighbourhoods experiencing higher poverty and related disadvantages were not only exposed to more violence in the immediate vicinity, but were also more vulnerable to the diffusion of violence from surrounding neighbourhoods.

The results for the race-housing factor, however, are much more varied. With the exception of the 1960s (where the race-housing factor was a significant predictor of both neighbourhood homicide rates and membership in high rate clusters), the influence of the race-housing factor differed depending on whether neighbourhood homicide rates or membership in high rate clusters was examined. In the 1950s through the 1970s, increases in the race-housing index were associated with increases in neighbourhood homicide rates (see Table 6.2). Thus, neighbourhoods with larger proportions of black residents, larger proportions of native born residents, and more black owner-occupied housing, were significantly more likely to experience higher rates of homicide. The race-housing factor did not, however, influence the likelihood of membership in a high rate cluster in the 1950s and the 1970s (see Table 6.8). The effect of the race-housing factor was reversed for the two dependent variables during the 1980s and 1990s such that it no

longer predicted neighbourhood homicide rates, but it was associated with membership in high rate clusters.

The importance of these differences is particularly evident when the comparisons are viewed over time. As residential segregation declined, a racial invariance in the influence of poverty and related disadvantages on homicide became increasingly apparent. That is, black neighbourhoods were no more likely than were white neighbourhoods to exhibit high homicide rates, controlling for poverty status. However, these new black neighbourhoods were in a precarious position as a function of their spatial proximity to a smaller cluster of highly violent neighbourhoods. Black neighbourhoods in Buffalo, while not at greater risk for higher rates of homicide than white neighbourhoods, became increasingly vulnerable to the diffusion of homicide given their geographic location in the city.

## **6.5 CONCLUSION**

The results of the analyses in this chapter show that, with the exception of poverty and related disadvantages, the kinds of neighbourhood characteristics that predict homicide rates and those that predict membership in high rate clusters differ both from one another and over time. This is particularly true when considering the spatial distribution of homicide across African American neighbourhoods in Buffalo. Yet it is only by examining these findings in the context of the city's unique social history, that the story of neighbourhood change and its influence on the spatial distribution of violence can be understood.

My findings show that, in Buffalo, higher neighbourhood poverty was associated with higher neighbourhood homicide rates from the 1950s through the 1990s. This effect confirms findings of studies in other cities and at other time periods. Not surprisingly, poverty is a strong and consistent risk factor for homicide within neighbourhoods. My analyses also showed that the effect of racial composition on neighbourhood homicide rates was more varied over time. An advantage of examining the relationship between neighbourhood characteristics and homicide rates in the city of Buffalo specifically is that high poverty neighbourhoods were not synonymous with African American neighbourhoods over the postwar period. As such, my analyses provided evidence for a racial invariance in neighbourhood homicide levels, but only as the proportion of African Americans residing in Buffalo grew. This supports recent studies on the relationship between racial composition and crime rates in showing that racial composition is spuriously associated with crime at the neighbourhood-level, once socioeconomic disadvantage is controlled. However, this racial invariance is evident only in the later decades of the twentieth century. The extreme racial segregation in Buffalo during the immediate postwar decades likely accounts for these disparate findings.

The second half of this chapter was devoted to analyzing neighbourhood vulnerabilities to the diffusion of homicide using a novel methodology. The results of this second set of analyses were instructive. In Buffalo, poverty and related disadvantages were doubly problematic for affected residents such that they not only increased the rate of homicide within neighbourhood boundaries, but they also increased the risk of the diffusion of homicide from adjacent neighbourhoods. Again, this result held for virtually the entire period under study. My findings also reveal that while

African American neighbourhoods in Buffalo did not exhibit higher internal rates of homicide than did comparable white neighbourhoods in recent decades, they were at greater risk of the diffusion of homicide from surrounding neighbourhoods. That is, African American neighbourhoods in Buffalo are more likely to be 'exposed' to violent neighbourhoods and thus vulnerable to the diffusion of violence. As a consequence, African American neighbourhoods might be described as 'spatially disadvantaged.'

I argue that the findings of this study show the necessity of examining 1) the unique social context of cities through a case-study approach, 2) a larger historical time frame, and 3) an explicitly ecological measure of homicide that can identify neighbourhoods vulnerable to diffusion. There are, however, a number of limitations to such an approach. For instance, the extent to which my findings are generalizable to other cities with different histories and in different parts of the country is not known. I would argue that Buffalo shares much in common with other mid-sized industrial urban centres in the north-east. It is, however, quite different from cities in the South and the West, regions which exhibit higher rates of homicide (Cohen 1998; Land et al. 1990).

In addition, I noted earlier in the chapter that the use of spatial econometric modeling to identify diffusion is an important advancement in neighbourhood-level research for both substantive and methodological reasons. The presence of a spatial lag effect, however, is merely suggestive of a diffusion process. It does not actually measure a diffusion of violence. Researchers assume that when rates of violence in contiguous neighbourhoods directly influence one another, controlling for other relevant predictors, then there must be some vector of transmission by which this direct effect occurs. Specifying the actual vector of transmission is much more difficult. I do not make

assumptions about the vector of transmission of homicide in Buffalo. Instead, my focus was on predicting *where* diffusion is most likely to happen, rather than *how* diffusion occurs.

Nonetheless, the findings of this chapter have significant implications for the 'neighbourhood effects' literature. They demonstrate that the spatial distribution of homicide in urban areas is a function of both within-neighbourhood characteristics and the location of neighbourhoods in the larger geography of the city. In extending the current social ecological literature to examine neighbourhoods vulnerable to the diffusion of homicide, my research underscores the importance of, and contributes to continued efforts in understanding the spatial distribution of homicide in urban areas.

**TABLE 6.1: Frequency Distribution of Neighbourhood Homicide Clusters  
1950s through 1990s, Buffalo**

	1950s		1960s		1970s		1980s		1990s	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
<b>High/High</b>	7	9.7	10	13.9	12	16.7	10	13.9	12	16.7
<b>Low/Low</b>	3	4.2	11	15.3	11	15.3	16	22.2	12	16.7
<b>Other*</b>	62	86.1	51	70.8	49	68.1	46	63.9	48	66.7
<b>Total</b>	72	100	72	100	72	100	72	100	72	100

\*Non significant, low/high, high/low

TABLE 6.2: Regression of Homicide Rates, Buffalo 1950 through 1990

	1950 OLS	1960 2 SLS	1970 2 SLS	1980 2 SLS	1990 2 SLS
<b>FACTOR 1*</b>	<b>0.236***</b> (0.065)	<b>0.276***</b> (0.089)	<b>0.831***</b> (0.249)	<b>0.373*</b> (0.182)	<b>0.728***</b> (0.155)
<b>FACTOR 2*</b>	<b>0.323***</b> (0.048)	<b>0.305***</b> (0.063)	<b>0.953***</b> (0.208)	0.330 (0.177)	0.404 (0.209)
% NATIVE BORN					-0.032 (0.057)
% YOUNG	0.009 (0.014)	0.015 (0.010)	<b>-0.050*</b> (0.023)	-0.002 (0.019)	<b>0.052*</b> (0.023)
% MALES NOT IN LF	0.005 (0.011)				
% FEMALES NOT IN LF	0.002 (0.016)	-0.004 (0.010)	<b>-0.053*</b> (0.025)		
% NO HIGH SCHOOL	0.005 (0.004)	0.001 (0.005)	0.020 (0.010)		
% BLACK OWNER- OCCUPIED HOUSING					<b>0.060***</b> (0.016)
% VACANT	-0.043 (0.098)				
% RES. MOBILE				-0.010 (0.011)	0.024 (0.015)
<b>SPATIAL LAG OF NEIGH. HOMICIDE RATES</b>		<b>0.555***</b> (0.185)	<b>0.418*</b> (0.205)	<b>0.788***</b> (0.210)	0.299 (0.176)
<b>CONSTANT/INTERCEPT</b>	-0.541 (0.837)	-0.134 (0.604)	4.258 (1.465)	0.713 (0.867)	1.499 (5.568)
$R^2$	0.5802	0.7430	0.7644	0.6499	0.7219
$ADJ. R^2$	0.5343	-	-	-	-

	Factor 1*	Factor 2*
1950	% in Poverty % Non Owner-Occupied Housing	% Black % Native Born % Black Owner-Occupied Housing
1960	% in Poverty % Non Owner-Occupied Housing % Males not in LF % Vacant % Residentially Mobile	% Black % Native Born % Black Owner-Occupied Housing
1970	% in Poverty % Non Owner-Occupied Housing % Males not in LF % Vacant % Residentially Mobile	% Black % Native Born % Black Owner-Occupied Housing
1980	% in Poverty % Non Owner-Occupied Housing % No High School % Males not in LF % Females not in LF % Vacant	% Black % Native Born % Black Owner-Occupied Housing
1990	% in Poverty % No High School % Males not in LF % Females not in LF	% Black % Non Owner-Occupied Housing % Vacant



**TABLE 6.3: Multinomial Logit Regression Predicting Neighbourhood Membership in High and Low Homicide Rate Clusters, Buffalo 1950s**

1950s	ORDINARY LEAST SQUARES REGRESSION	MULTINOMIAL LOGISTIC REGRESSION*	
		HIGH/HIGH CLUSTER MEMBERSHIP	LOW/LOW CLUSTER MEMBERSHIP
<b>FACTOR 1</b> % IN POVERTY % NON OWNER- OCCUPIED HOUSING	<b>0.236***</b> (0.065)	<b>2.329*</b> (1.073) [10.270]	<b>-1.329</b> (1.397) [0.265]
<b>FACTOR 2</b> % BLACK % NATIVE BORN % BLACK OWNER- OCCUPIED HOUSING	<b>0.323***</b> (0.048)	1.363 (0.854) [3.909]	0.975 (1.385) [2.652]
% YOUNG	0.009 (0.014)	0.377 (0.291) [1.458]	-0.232 (0.272) [0.793]
% NO HIGH SCHOOL	0.005 (0.004)	0.228 (0.175) [1.256]	0.105 (0.093) [1.111]
% MALES NOT IN LF	0.005 (0.011)	0.344 (0.262) [1.411]	-0.179 (0.350) [0.836]
% FEMALES NOT IN LF	0.002 (0.016)	-0.562 (0.429) [0.570]	-0.060 (0.355) [0.942]
% VACANT	-0.043 (0.098)	-0.543 (1.200) [0.581]	-0.146 (1.979) [0.864]
CONSTANT/INTERCEPT	-0.541 (0.837)	-1.764 (13.336)	2.707 (28.384)
$R^2$	0.5802	-	-
ADJ. $R^2$	0.5343	-	-
NAGELKERKE PSEUDO $R^2$	-	0.641	-
-2 LOG LIKELIHOOD	-	33.512	-
CHI-SQUARE	-	36.729	-
N	72	7	3

\*Reference Group for Multinomial Logistic Regression is "Other" (NS, HL, LH) (N=62)  
Coefficient, (Standard Error), [Odds Ratio]

**TABLE 6.4: Multinomial Logit Regression Predicting Neighbourhood Membership in High and Low Homicide Rate Clusters, Buffalo 1960s**

1960s	TWO-STAGE LEAST SQUARES REGRESSION	MULTINOMIAL LOGISTIC REGRESSION*	
		HIGH/HIGH CLUSTER MEMBERSHIP	LOW/LOW CLUSTER MEMBERSHIP
<b>FACTOR 1</b> % IN POVERTY % NON OWNER-OCCUPIED HOUSING % MALES NOT IN LF % VACANT % RES. MOBILE	<b>0.276***</b> (0.089)	<b>3.427**</b> (1.187) [30.775]	<b>-2.624**</b> (0.962) [0.073]
<b>FACTOR 2</b> % BLACK % NATIVE BORN % BLACK OWNER- OCCUPIED HOUSING	<b>0.305***</b> (0.063)	<b>1.280*</b> (0.505) [3.598]	<b>-0.461</b> (0.564) [0.631]
% YOUNG	0.015 (0.010)	X	X
% FEMALES NOT IN LF	-0.004 (0.010)	X	X
% NO HIGH SCHOOL	0.001 (0.005)	X	X
SPATIAL LAG OF NEIGHBOURING HOMICIDE RATES	<b>0.555**</b> (0.185)	-	-
CONSTANT/INTERCEPT	-0.134 (0.604)	-4.052 (1.247)	-2.888 (0.746)
$R^2$	0.7430	-	-
ADJ. $R^2$	-	-	-
NAGELKERKE PSEUDO $R^2$	-	0.650	-
-2 LOG LIKELIHOOD	-	63.089	-
CHI-SQUARE	-	52.899	-
N	72	10	11

\*Reference Group for Multinomial Logistic Regression is "Other" (NS, HL, LH) (N=51)

X – Variables omitted from the analysis as inclusion created quasi-complete separation of the data  
Coefficient, (Standard Error), [Odds Ratio]

**TABLE 6.5: Multinomial Logit Regression Predicting Neighbourhood Membership in High and Low Homicide Rate Clusters, Buffalo 1970s**

1970s	TWO-STAGE LEAST SQUARES REGRESSION	MULTINOMIAL LOGISTIC REGRESSION*	
		HIGH/HIGH CLUSTER MEMBERSHIP	LOW/LOW CLUSTER MEMBERSHIP
<b>FACTOR 1</b> % IN POVERTY % NON OWNER-OCCUPIED HOUSING % MALES NOT IN LF % VACANT % RESIDENTIALLY MOBILE	<b>0.831***</b> (0.249)	<b>4.314**</b> (1.614) [74.721]	<b>-3.165**</b> (1.181) [0.042]
<b>FACTOR 2</b> % BLACK % NATIVE BORN % BLACK OWNER- OCCUPIED HOUSING	<b>0.953***</b> (0.208)	1.336 (0.816) [3.806]	-1.260 (1.414) [0.284]
% YOUNG	<b>-0.050*</b> (0.023)	-0.054 (0.112) [0.947]	0.045 (0.099) [1.046]
% FEMALES NOT IN LF	<b>-0.053*</b> (0.025)	-0.307 (0.174) [0.736]	-0.017 (0.111) [0.983]
% NO HIGH SCHOOL	0.020 (0.010)	0.235 (0.159) [1.265]	-0.042 (0.034) [0.959]
SPATIAL LAG OF NEIGHBOURING HOMICIDE RATES	<b>0.418*</b> (0.205)	-	-
CONSTANT/INTERCEPT	4.258 (1.465)	-0.605 (7.944)	-1.650 (7.260)
<i>R</i> <sup>2</sup>	0.7644	-	-
<i>ADJ. R</i> <sup>2</sup>	-	-	-
<i>NAGELKERKE PSEUDO R</i> <sup>2</sup>	-	0.750	-
<i>-2 LOG LIKELIHOOD</i>	-	53.791	-
<i>CHI-SQUARE</i>	-	68.259	-
<i>N</i>	72	12	11

\*Reference Group for Multinomial Logistic Regression is "Other" (NS, HL, LH) (N=49)  
Coefficient, (Standard Error), [Odds Ratio]

**TABLE 6.6: Multinomial Logit Regression Predicting Neighbourhood Membership in High and Low Homicide Rate Clusters, Buffalo 1980s**

1980s	TWO-STAGE LEAST SQUARES REGRESSION	MULTINOMIAL LOGISTIC REGRESSION*	
		HIGH/HIGH CLUSTER MEMBERSHIP	LOW/LOW CLUSTER MEMBERSHIP
<b>FACTOR 1</b> % IN POVERTY % NON OWNER-OCCUPIED HOUSING % NO HIGH SCHOOL % MALES NOT IN LF % FEMALES NOT IN LF % VACANT	<b>0.373*</b> (0.182)	<b>1.519**</b> (0.488) [4.570]	<b>-2.077*</b> (0.820) [0.125]
<b>FACTOR 2</b> % BLACK % NATIVE BORN % BLACK OWNER- OCCUPIED HOUSING	0.330 (0.177)	<b>1.744**</b> (0.560) [5.723]	<b>-3.132*</b> (1.303) [0.044]
% YOUNG	-0.002 (0.019)	-0.161 (0.077) [0.851]	0.053 (0.074) [1.054]
% RES. MOBILE	-0.010 (0.011)	-0.043 (0.059) [0.958]	0.059 (0.043) [1.061]
<b>SPATIAL LAG OF NEIGHBOURING HOMICIDE RATES</b>	<b>0.788***</b> (0.210)	-	-
<b>CONSTANT/INTERCEPT</b>	0.713 (0.867)	2.899 (3.644)	-6.695 (3.626)
<b>R<sup>2</sup></b>	0.6499	-	-
<b>ADJ. R<sup>2</sup></b>	-	-	-
<b>NAGELKERKE PSEUDO R<sup>2</sup></b>	-	0.581	-
<b>-2 LOG LIKELIHOOD</b>	-	81.151	-
<b>CHI-SQUARE</b>	-	47.679	-
<b>N</b>	72	10	16

\*Reference Group for Multinomial Logistic Regression is "Other" (NS, HL, LH) (N=46)  
Coefficient, (Standard Error), [Odds Ratio]

**TABLE 6.7: Multinomial Logit Regression Predicting Neighbourhood Membership in High and Low Homicide Rate Clusters, Buffalo 1990s**

1990s	TWO-STAGE LEAST SQUARES REGRESSION	MULTINOMIAL LOGISTIC REGRESSION*	
		HIGH/HIGH CLUSTER MEMBERSHIP	LOW/LOW CLUSTER MEMBERSHIP
<b>FACTOR 1</b> % IN POVERTY % NO HIGH SCHOOL % MALES NOT IN LF % FEMALES NOT IN LF	<b>0.728***</b> (0.155)	1.323 (0.794) [3.756]	<b>-3.176**</b> (1.097) [0.042]
<b>FACTOR 2</b> % BLACK % NON OWNER- OCCUPIED HOUSING % VACANT	0.404 (0.209)	<b>1.829*</b> (0.858) [6.225]	-1.651 (1.637) [0.192]
% YOUNG	<b>0.052*</b> (0.023)	0.346 (0.202) [1.414]	0.007 (0.131) [1.007]
% NATIVE BORN	-0.032 (0.057)	-0.295 (0.354) [0.744]	-0.110 (0.224) [0.895]
% BLACK OWNER- OCCUPIED HOUSING	<b>0.060***</b> (0.016)	0.095 (0.061) [1.099]	-0.806 (0.506) [0.447]
% RES. MOBILE	0.024 (0.015)	-0.060 (0.088) [0.941]	-0.154 (0.097) [0.857]
SPATIAL LAG OF NEIGHBOURING HOMICIDE RATES	0.299 (0.176)	-	-
CONSTANT/INTERCEPT	1.499 (5.568)	16.972 (32.300)	13.826 (22.010)
$R^2$	0.7219	-	-
ADJ. $R^2$	-	-	-
NAGELKERKE PSEUDO $R^2$	-	-	0.750
-2 LOG LIKELIHOOD	-	-	55.659
CHI-SQUARE	-	-	69.270
N	72	12	12

\*Reference Group for Multinomial Logistic Regression is "Other" (NS, HL, LH) (N=48)  
Coefficient, (Standard Error), [Odds Ratio]

**TABLE 6.8: Multinomial Regression of "High High" Neighbourhood Clusters<sup>†</sup>  
Buffalo 1950 through 1990**

	1950 HIGH/HIGH	1960 HIGH/HIGH	1970 HIGH/HIGH	1980 HIGH/HIGH	1990 HIGH/HIGH
<b>FACTOR 1*</b>	<b>2.329*</b> (1.073) [10.270]	<b>3.427**</b> (1.187) [30.775]	<b>4.314**</b> (1.614) [74.721]	<b>1.519**</b> (0.488) [4.570]	<b>1.323</b> (0.794) [3.756]
<b>FACTOR 2*</b>	<b>1.363</b> (0.854) [3.909]	<b>1.280*</b> (0.505) [3.598]	<b>1.336</b> (0.816) [3.806]	<b>1.744**</b> (0.560) [5.723]	<b>1.829*</b> (0.858) [6.225]
% NATIVE BORN					-0.295 (0.354) [0.744]
% YOUNG	0.377 (0.291) [1.458]	X	-0.054 (0.112) [0.947]	-0.161 (0.077) [0.851]	0.346 (0.202) [1.414]
% MALES NOT IN LF	0.344 (0.262) [1.411]				
% FEMALES NOT IN LF	-0.562 (0.429) [0.570]	X	-0.307 (0.174) [0.736]		
% NO HIGH SCHOOL	0.228 (0.175) [1.256]	X	0.235 (0.159) [1.265]		
% BLACK OWNER- OCCUPIED HOUSING					0.095 (0.061) [1.099]
% VACANT	-0.543 (1.200) [0.581]				
% RES. MOBILE				-0.043 (0.059) [0.958]	-0.060 (0.088) [0.941]
CONSTANT/INTERCEPT	-1.764 (13.336)	-4.052 (1.247)	-0.605 (7.944)	2.899 (3.644)	16.972 (32.300)
<b>NAGELKERKE R<sup>2</sup></b>	<b>0.641</b>	<b>0.650</b>	<b>0.750</b>	<b>0.581</b>	<b>0.750</b>

	Factor 1*	Factor 2*
1950	% in Poverty % Non Owner-Occupied Housing	% Black % Native Born % Black Owner-Occupied Housing
1960	% in Poverty % Non Owner-Occupied Housing % Males not in LF % Vacant % Residentially Mobile	% Black % Native Born % Black Owner-Occupied Housing
1970	% in Poverty % Non Owner-Occupied Housing % Males not in LF % Vacant % Residentially Mobile	% Black % Native Born % Black Owner-Occupied Housing
1980	% in Poverty % Non Owner-Occupied Housing % No High School % Males not in LF % Females not in LF % Vacant	% Black % Native Born % Black Owner-Occupied Housing
1990	% in Poverty % No High School % Males not in LF % Females not in LF	% Black % Non Owner-Occupied Housing % Vacant

<sup>†</sup> Only "high high" category results reported; reference is non-significant tracts

## CHAPTER VII. SUMMARY AND CONCLUSIONS

In examining the spatial distribution of homicide across Buffalo's neighbourhoods, and changes in that spatial distribution over five decades, this study has yielded findings that are important for explaining how and why homicide concentrates where it does in urban areas. The literature on neighbourhoods and crime has consistently shown that the structural characteristics of neighbourhoods – including their demographic, socioeconomic, and housing features – influence the levels of violence they exhibit (Bursik and Grasmick 1993; Krivo and Peterson 2000; Sampson and Groves 1989; Sampson et al. 2002). Not surprisingly, I find this to be true in Buffalo. Recent attention to the larger social ecology of the city has led scholars to consider how the structural characteristics and levels of violence in adjoining areas influence neighbourhood violence (Anselin et al. 2000; Baller et al. 2001; Messner et al. 1999). According to my analyses, Buffalo neighbourhoods were also influenced by levels of homicide in surrounding neighbourhoods.

But while the extant literature emphasizes the utility of incorporating urban geography into analyses of neighbourhood effects, it is limited to predicting levels of violence *within neighbourhoods* as a function of the urban geography. The findings that I presented in this dissertation build upon this literature by incorporating the social ecology of the city to explain *concentrations* of homicide *across neighbourhood boundaries*. That is, my analyses show that homicide exhibited *relocation diffusion* to contiguous neighbourhoods in Buffalo, and neighbourhoods vulnerable to this diffusion shared characteristics that distinguished them in important ways from the rest of the city.

I was motivated in this study by questions that developed out of the assumptions made in the neighbourhood effects literature and, more precisely, in the literature on the permeability of neighbourhood boundaries to diffusion of violence from adjoining areas. I argue that a number of issues remain unresolved in these literatures, all of which can be settled only by an examination of urban homicide that extends over a relatively long time span. For example, by relying on cross-sectional analyses or limiting the time span to ten or twenty years, researchers are unable to demonstrate: 1) whether there is an historical invariance in the types of neighbourhoods that experience high levels of homicide; 2) whether the same kinds of characteristics that intersect in neighbourhoods – particularly those that are presently associated with high homicide rates – persist over time; and 3) whether there are shifts in the spatial distribution of homicide across the city. Additionally, if the spatial distribution of homicide does shift, and this shift is assumed to result from a process of diffusion, then the process necessarily unfolds over time. Yet it is unclear how swiftly this process occurs because researchers have not examined historical data on the changing distribution of homicide in cities. I argue that it is only in examining these trends over many decades that the process of diffusion, as well as the influence of neighbourhood characteristics on the spatial distribution of homicide, can be fully understood.

Using information about the unique historical context of Buffalo, as well as citywide changes in its population, its economy, and its neighbourhoods, the question stimulating my dissertation was deceptively simple. To what extent was there stability in the distribution of homicide across neighbourhoods in Buffalo over five decades? I also examined whether the neighbourhood characteristics that predicted homicide rates were



consistent, whether and how homicide diffused across Buffalo neighbourhoods, and which neighbourhood characteristics were associated with vulnerability to the diffusion of homicide. This study contributes to a growing literature on the causes and consequences of violence in urban neighbourhoods, with an emphasis on how the diffusion of violence across neighbourhood boundaries is patterned in specific, and as yet unexamined, ways.

This chapter proceeds as follows. First, I outline the main findings of the preceding chapters, detailing how my historical case study of Buffalo neighbourhoods both confirmed and extended the literature on neighbourhoods and crime. Second, I highlight the significance and implications of those findings for the larger theoretical literature, focusing more precisely on social disorganization, social ecology, neighbourhood effects, and diffusion. Third, I summarize the policy implications of my study of neighbourhood homicide and diffusion in Buffalo. Fourth, I reiterate two key contributions of the present study; emphasizing first, the importance of extended case study approaches and second, the need for greater attention to the social ecology of violence across entire cities in the neighbourhoods and crime literature. Fifth, I describe directions for future research based on the findings of this study. Finally, I review the limitations of my study and make recommendations for remedying those limitations in future research.

## **7.1 SUMMARY OF FINDINGS**

In previous chapters, I provided an overview of the dramatic demographic, social, and economic changes that characterized Buffalo's uncomfortable transition to a

post-industrial economy between 1950 and the end of the twentieth century (see Chapters 1 to 3). Thriving manufacturing industries, coupled with the presence of distinctive ethnic neighbourhoods, gave Buffalo both character and vitality in the early postwar period. Soon thereafter, however, unemployment became an increasingly important problem for Buffalo residents, particularly for those employed in manufacturing (which comprised more than half of the workforce). At the same time, changes in the demographic characteristics of the population arose in response to an influx of African American migrants from the South and 'white flight' of ethnic residents to the suburbs. During the postwar period and through the end of the century, Buffalo could be described as a highly segregated city teetering on the brink of financial ruin. These large-scale changes differentially affected neighbourhoods, exacerbating racial tensions and depleting the city's tax base as a function of considerable population loss. It was only through incorporating this larger context of citywide and neighbourhood-level changes over the five postwar decades that changes in the spatial distribution of homicide across Buffalo neighbourhoods could be understood.

A closer examination of the characteristics of Buffalo's neighbourhoods over this period of rapid social change provided an opportunity to explore whether the kinds of characteristics that cluster together in present-day neighbourhoods (particularly those characteristics associated with crime and violence), were the same kinds of characteristics that intersected in neighbourhoods in the past. The results of Chapter 5 showed that, over five decades in Buffalo, high poverty neighbourhoods became increasingly disadvantaged such that a growing number of socioeconomic and housing problems concentrated there. There was, however, an historical invariance in what I call a race-housing index

(comprised of percent black, percent native born, and percent black owner-occupied housing). These results showed that black neighbourhoods in Buffalo were not wholly, or even heavily, high poverty neighbourhoods despite the hypersegregation by race across the city. Wilson (1987) has argued that black neighbourhoods in Chicago's inner city tend to be not only economically disadvantaged, but defined by a wide variety of social and economic dislocations. These inner city neighbourhoods also tend to exhibit high rates of crime and violence. In Buffalo, a larger number of disadvantages came to typify high poverty neighbourhoods between 1950 and 1990; however, racial composition was not among them.

In an analysis of the characteristics associated with neighbourhood homicide rates in Buffalo at each decade, I demonstrated that homicide affected different kinds of neighbourhoods over time (see Chapter 6). That is, at each decade the poverty-related index predicted neighbourhood homicide rates, yet the race-housing index was only predictive of homicide in the 1950s through the 1970s. Apart from the 1950s, neighbourhood homicide rates were influenced by the homicide rates in adjoining areas, although this spatial effect did not reach significance in the 1990s. Taken together, then, neighbourhood homicide rates were primarily dependent on internal socioeconomic conditions and the neighbourhood's geographic proximity to violence, but were increasingly less dependent on racial composition as the twentieth century drew to a close. These results point to a growing racial invariance in neighbourhood effects on homicide rates, once socioeconomic indicators have been taken into account.

A logical conclusion about the spatial distribution of homicide can be deduced from the findings that geographic proximity to highly violent neighbourhoods were

associated with neighbourhood homicide rates for most of the decades under study. That is, if homicide does indeed diffuse across neighbourhood boundaries, then there *should* be some discernable change in the spatial distribution of homicide across the city over time. The results of my analyses showed that the spatial distribution of homicide was not static between 1950 and the end of the century (refer to Chapter 4). Rather, there was evidence of a *relocation diffusion* of homicide across neighbourhoods. The results showed that a cluster of between eight and 12 neighbourhoods exhibiting higher than average homicide rates relocated from the downtown core at mid-century further into the East Side at each consecutive decade. This suggests that homicide-affected neighbourhoods early in the period under study differed from similarly affected neighbourhoods later in the period. Moreover, this pattern could only be identified over three or more decades. Had I examined these patterns over any two decades, the type of diffusion that I would have observed would have been more consistent with an *expansion diffusion* of homicide. I argue, then, that it is necessary to examine the process of diffusion over longer periods of time because it is a process that unfolds gradually.

The relocation diffusion of homicide across contiguous neighbourhoods in Buffalo begs the question: were there particular neighbourhood characteristics that were associated with membership in these high homicide rate clusters? Said differently, what types of neighbourhoods were vulnerable to the diffusion of homicide in Buffalo? In Chapter 6, I showed that the types of neighbourhoods vulnerable to the diffusion of homicide differed over time. Neighbourhoods high in poverty and related disadvantages were vulnerable to diffusion; however this effect became more muted in later decades. Importantly, black neighbourhoods exhibited greater vulnerability to the diffusion of

homicide across their borders by the 1980s and 1990s. These results demonstrate that while black neighbourhoods were no more likely than white neighbourhoods to exhibit high rates of homicide once other socioeconomic and housing variables were controlled, they were markedly more susceptible to the diffusion of homicide from nearby violent neighbourhoods by the end of the century. As such, minority neighbourhoods in Buffalo were in a spatially precarious position relative to majority neighbourhoods.

## **7.2 THEORETICAL OVERVIEW AND IMPLICATIONS**

### **7.2.1 The Social Ecology of Social Disorganization**

The findings of this study have theoretical implications that extend beyond merely predicting the structural characteristics of neighbourhoods that are associated with violence. Social disorganization theory is based on the premise that demographic, socioeconomic, and housing characteristics create neighbourhood contexts that either inhibit or foster crime and violence. In effect, neighbourhoods that have few socioeconomic resources at their disposal, neighbourhoods that are high in residential turnover, and neighbourhoods that are occupied by residents who lack a stake in the future of the area are neighbourhoods that exhibit few social controls on the behaviour of locals and outsiders (Sampson and Groves 1989; Shaw and McKay 1942).

Bursik and Grasmick (1993) argue that an extension to social disorganization theory is required because it neglects the larger context of the city by focusing entirely on within-neighbourhood processes. In linking Hunter's (1985) concepts of private, parochial, and public control to the neighbourhood effects literature, Bursik and Grasmick (1993) contend that while internal social controls influence the levels of crime

and violence in neighbourhoods, external controls do as well. More specifically, neighbourhood crime levels are dependent on "...the ability of the community to secure public goods and services that are allocated by agencies located outside the neighborhood" (Bursik and Grasmick 1993: 17). The analyses undertaken in this dissertation, focusing on neighbourhood characteristics and homicide across the city of Buffalo, underscored the importance of extra-local factors as well. However, my emphasis could be described as the flip side of Bursik and Grasmick's (1993) coin. That is, just as access to resources outside of the neighbourhood impedes internal crime and violence, exposure to violence in geographically proximate neighbourhoods contributes to internal crime and violence. In effect, I suggest that within-neighbourhood social disorganization may be exacerbated when neighbourhoods are spatially proximal to extra-local violence.

These arguments are consistent with the general theme of social ecological research which suggests that "...there are community structural effects on crime that are independent of (and causally prior to) individual effects" (Byrne and Sampson 1986b: vi). Only in examining the structural characteristics that comprise the neighbourhood context can a full understanding of the social processes conducive to crime and violence be appreciated. But further, researchers need to incorporate information about how the larger context of the city and the spatial location of neighbourhoods across the city also impinge on neighbourhood levels of crime and violence. In considering a nested socioecological approach, wherein residents who exhibit particular characteristics are nested within neighbourhoods and those neighbourhoods are nested in a particular spatial

configuration within cities, the findings of my dissertation highlight the importance of incorporating the larger social context of the city in urban criminology.

### **7.2.2 Temporal Trends in the Social Ecology of Homicide**

By definition, changes in the social ecology of the city necessarily occur over time. As Bursik (1984: 408) argues, "...the ecological structure of delinquency is sensitive to urban dynamics which may not be constant." Thus, a neglected consideration in neighbourhood-level research is how the empirical findings of this literature are rooted in cities with unique histories; histories that may alter the nature and trajectory of the spatial distribution of violence over time. The migration patterns of racial populations, for example, may affect where violence is located at different periods during the migration (see Liska and Bellair 1995 on racial dynamics and crime; see Van Wilsem, Wittebrood and De Graaf 2006 on socioeconomic dynamics and crime). In this dissertation, I argue that attention to changes in the characteristics of neighbourhoods over time is crucial to understanding how and why homicide diffuses across cities in the manner that it does.

In incorporating a temporal dimension to my study of Buffalo, I extended current neighbourhood effects research by delineating whether there was an historical contingency or an historical invariance in the types of neighbourhood characteristics that were associated with neighbourhood homicide rates. While poverty and related socioeconomic disadvantages uniformly affected neighbourhood homicide rates, the influence of racial composition was much more complex. My research showed that racial composition was important for predicting neighbourhood homicide rates in the immediate postwar decades in Buffalo, in part because of the extreme residential segregation of the

black community in neighbourhoods on the outskirts of the downtown core. Recall that Buffalo's black community was exceptionally small in 1950, but as the black population grew, they expanded into a larger number of neighbourhoods in the following decades, pushing further eastward into the East Side. My results confirmed that as this process transpired, racial composition became increasingly unimportant in predicting neighbourhood homicide rates. This finding supports recent research suggesting that there is a racial invariance in levels of neighbourhood violence after socioeconomic status is controlled (Kriwo and Peterson 1996; McNulty 2001; Morenoff et al. 2001; Sampson and Wilson 1995; Shihadeh and Shrum 2004).

### **7.2.3 Across-Neighbourhood Outcomes**

The genuine importance of my findings for extending the neighbourhood effects literature beyond what has already been discovered is provided in my analyses of the neighbourhood characteristics predicting membership in high homicide rate clusters. My results showed opposite effects of racial composition on neighbourhood homicide rates and membership in high rate clusters. In effect, I demonstrated that while there was evidence of a racial invariance in the predictors of *internal* neighbourhood homicide, racial composition became remarkably more important in predicting *vulnerability to the diffusion of homicide* across their borders. Again, this shows that black neighbourhoods in Buffalo face an increasing precariousness to homicide as a function of their spatial location across the urban landscape.

My findings are consistent with Sampson et al.'s (1999) discovery that neighbourhood collective efficacy is influenced not only by internal characteristics, but also by levels of collective efficacy in surrounding neighbourhoods. They demonstrate



that racial composition distinguished between neighbourhoods that were “spatially advantaged” and “spatially vulnerable.” That is, white neighbourhoods low in collective efficacy were far more likely to be surrounded by neighbourhoods high in collective efficacy than were black neighbourhoods in Chicago. I argue that the neighbourhood effects literature would benefit from continuing to pursue analyses that incorporate the socioecological distribution of homicide (and other characteristics) *across* neighbourhoods rather than limiting the analyses to purely *within*-neighbourhood outcomes.

#### **7.2.4 Predicting the Pattern of Diffusion**

Research on neighbourhoods and crime has been invigorated in the past few years with the introduction of spatial econometric modeling and Geographic Information Systems as tools in which to incorporate information about the influence of surrounding neighbourhoods. The dominant interpretation of a significant spatial influence is diffusion. That is, if the homicide rates in adjoining neighbourhoods matter for predicting internal homicide rates over-and-above internal structural characteristics, then some direct process of diffusion of homicide across contiguous neighbourhoods is present. Baller et al. (2005) indicate that research on American neighbourhoods, cities, and counties consistently shows that homicide diffuses to adjoining areas; and Fischer (1980) also finds evidence consistent with the hypothesis that crime diffuses from urban centres to the countryside in a regular, cyclical pattern. The concept of diffusion implies that the spatial distribution of homicide across cities should therefore vary over time.

Relatively unexplored are questions about which direction, or where, homicide is most likely to diffuse and why it diffuses to the places it does. In contributing to a

diffusion literature in its infancy, I demonstrated that homicide exhibited a particular pattern of diffusion (i.e., *relocation diffusion*) that was discernible only after multiple decades. I also showed that the most significant influence on neighbourhood vulnerability to homicide diffusion during the 1980s and 1990s was racial composition. Importantly, this finding did not simply replicate the results predicting within-neighbourhood homicide rates. Instead, the neighbourhood characteristics associated with vulnerability were different from those associated with neighbourhood homicide rates. I argue that the analyses presented in this dissertation contributes to the social ecological literature by situating neighbourhoods in their appropriate urban context, by exploring how social and demographic changes in the city influence changes in the social ecology of homicide, and by explaining those shifts in the spatial distribution of violence by showing not only that diffusion happened but also that it happened in ways that could be predicted based on the structural characteristics of neighbourhoods.

### **7.3 POLICY IMPLICATIONS**

To borrow from Andrews (1985), the “ecology of risk” and the “geography of intervention” are appropriate organizing frameworks for considering the policy implications of this study. In outlining the relocation diffusion process of homicide across Buffalo neighbourhoods, and examining the characteristics that made neighbourhoods vulnerable to the diffusion of homicide, I argue that a more thorough understanding of ecological risks and vulnerabilities may aid in targeting neighbourhoods for anticipatory intervention to prevent the diffusion of violence. To date, the literature shows that homicide (as well as other forms of crime and violence) diffuses across

neighbourhood boundaries. However, sociologists have been unable to extend this knowledge into the policy arena because they have not focused on the characteristics that make neighbourhoods vulnerable to diffusion.

It is important to note that the policy implications I consider below are concerned with identifying and protecting *neighbourhoods* that are vulnerable to the diffusion of homicide. This is not the same as delineating policies that would target either particular kinds of homicide, or policies aimed at preventing offenders from offending. My dissertation did not evaluate the extent to which the homicides captured in Buffalo's neighbourhood rates were committed by or against "locals." Therefore, little can be said about whether the neighbourhoods inhabited by offenders and victims bear any relationship to the neighbourhoods where they offend or are victimized. In effect, the policy implications described below are intended to address strategies for detecting the 'kinds of places' vulnerable to diffusion, not strategies for preventing 'kinds of people' from committing homicide. I return to a discussion of this important distinction in section 7.5.4.

In understanding how violence moves across the urban landscape (or the "ecology of risk"), policy makers will be in a position to direct community-building initiatives and policing resources to those neighbourhoods most vulnerable to the diffusion of homicide. My dissertation shows that, at least in Buffalo, changes in the spatial distribution of homicide took the form of *relocation diffusion* between the 1950s and the 1990s. That is, neighbourhoods with significantly high rates of homicide clustered with between eight and twelve other neighbourhoods over five decades. However, the actual neighbourhoods that combined to form the high rate cluster changed over time. My

results also showed that the diffusion process responsible for the relocation of homicide was a gradual one. This suggests that policy makers may be able to effectively forecast and target policing resources to protect vulnerable neighbourhoods that are spatially proximal to, but as yet unaffected by, the most violent areas of the city. In doing so, this strategy will help to contain violence in urban areas, and thus create a two-pronged approach that coincides with programs aimed solely at preventing homicide in already-violent neighbourhoods.

My findings also illustrate that African American neighbourhoods in Buffalo, independent of their socioeconomic status, were at heightened risk of membership in high homicide rate clusters. This was particularly true as the century drew to a close. These results indicate that African American neighbourhoods were in a spatially precarious position relative to white neighbourhoods, given that they bordered the “urban ghetto.”

While speculative, these findings suggest at least two avenues to pursue that could reduce the vulnerability of both 1) high poverty and 2) African American neighbourhoods in Buffalo to the diffusion of homicide. First, the Department of Housing and Urban Development (HUD) has sponsored HOPE VI programs in a number of cities. These programs are designed to demolish high-density, distressed public housing developments and replace them with mixed-income, mixed-use facilities in an effort to stimulate community building, reduce social isolation, and encourage home ownership. The results of these programs have been generally positive for those who reside in distressed public housing developments, and for the surrounding communities (Abt Associates Inc 2003; Naparstek et al. 2000).

In 1997, the Buffalo Municipal Housing Authority was awarded more than \$20 million to revitalize Lakeview Homes, a public housing development on Buffalo's Lower West Side (U.S. Department of Housing and Urban Development 1997). On the East Side, Pratt-Willert Village created more than 300 single-family affordable housing units suitable for home ownership during the late 1980s (Price 1991). The changes in Pratt-Willert Village led middle-income African Americans to return to neighbourhoods once thought to be "unsalvageable" and helped to reduce the criminal opportunities associated with vacant apartments and buildings (Price 1991). Continued emphasis on creating mixed-income communities in Buffalo, combined with federal assistance to promote these mixed-income neighbourhoods, may assist in reducing the vulnerability of Buffalo's high poverty neighbourhoods to the diffusion of violence.

However, in analyzing the characteristics that made Buffalo neighbourhoods vulnerable to diffusion, I showed that poverty and related disadvantages had actually become less important as a predictor of vulnerability than was racial composition in the final two decades of the twentieth century. This suggests that efforts encouraging the racial integration of Buffalo neighbourhoods, particularly those on the East Side, would lessen the burden faced by African Americans in these spatially disadvantaged neighbourhoods. Stimulating developer interest in residential projects through tax incentives or other programs that would draw suburban residents back into Buffalo's central city would serve multiple purposes. First, it would increase the tax base for the city as a whole, generating resources that could be directed toward both community building and policing; and second, it could aid in racially integrating neighbourhoods that have long been segregated in Buffalo.

Of course, complicating a strategy to better integrate Buffalo neighbourhoods are selection effects. Residents are not randomly assigned to neighbourhoods, and while many past urban planning initiatives have actually stimulated racial segregation (intentionally or otherwise), research also shows that racial and ethnic groups, in some cases, prefer segregated neighbourhoods (Squires and Kubrin 2005). Nonetheless, incentives aimed at integrating neighbourhoods, combined with investments in neighbourhoods that foster local organizations and local improvement projects, may help to buffer against the diffusion of violence in neighbourhoods precariously close to the most violent areas of the city.

Finally, the analyses presented in this dissertation could serve as a planning tool to help law enforcement identify the neighbourhoods that are vulnerable to the diffusion of violence. This would allow police to ascertain which neighbourhoods are suitable “geographies for intervention.” At the behest of the mayor of Buffalo, and under the direction of the police commissioner, a number of community policing initiatives developed in Buffalo during the mid- to late-1990s. Community Oriented Policing Satellite Stations (COPS) have been set up in neighbourhoods throughout the city to deal with “quality of life” issues and neighbourhood disorder. Community police officers have also been stationed in every policing district in the city to promote citizen-police cooperation and interaction.<sup>100</sup> These initiatives, while valuable in their own right, might be more effective if they were concentrated in the neighbourhoods most at risk to the diffusion of violence. I argue that in determining why violence diffuses to particular

---

<sup>100</sup> Both the Buffalo Police Department and the U.S. Department of Housing and Urban Development have issued statements on Buffalo’s involvement in these community-policing initiatives. These statements can be accessed at [http://www.city-buffalo.com/Files/1\\_2\\_1/Police/cops.htm](http://www.city-buffalo.com/Files/1_2_1/Police/cops.htm) (accessed August 2006) and <http://www.huduser.org/periodicals/fieldworks/0801/fworks3.htm> (accessed May 2002).

neighbourhoods, and alternatively what factors serve to block the diffusion of violence in other neighbourhoods, law enforcement may be better able to contain the spread of violence and target both proactive and reactive policing resources to those neighbourhoods that are at greatest risk.

#### 7.4 MAIN CONTRIBUTIONS OF THE STUDY

Shinn and Toohey (2003: 428) argue that failure to consider the importance of neighbourhood effects may result in “context minimization error” which they claim “...leads to impoverished theory.” In this study, I argue that even research exalting the importance of neighbourhood effects often does so at the expense of reflecting on how “...larger social and political forces...may support or undermine communities” (Shinn and Toohey 2003: 429). In choosing an historical case-study approach, I was able to examine the neighbourhood contexts associated with homicide both over an extended time frame and embedded within a larger story of citywide change in Buffalo, New York. Moreover, the findings of my study shed light on the length of time over which the diffusion of homicide occurs in cities, and how that diffusion is patterned by the characteristics of adjacent neighbourhoods.

The utility of a case study approach is frequently debated in the sociological literature (Hamel 1992; Platt 1992; Ragin and Becker 1992; Thacher 2006). Burawoy (1998: 5) reasons that a richness of understanding can be drawn from an extended case study approach<sup>101</sup> that seeks to “...extract the general from the unique, to move from the

---

<sup>101</sup> Burawoy (1998) identifies the extended case method as an inherently ethnographic approach, yet there is no reason why participant observation need necessarily be the methodological tool used in every extended case study. Indeed, in treating a city as the “case” and examining the historical context of neighbourhoods

“micro” to the “macro,” and to connect the present to the past in anticipation of the future.” It is only by incorporating in-depth information on changes in the larger society, the unique influences of those changes on one city, and the extent to which the effects play out across neighbourhoods that urban criminologists can understand how and why neighbourhoods are differentially affected by violence.

For example, very different inferences would be drawn about the accuracy of the racial invariance hypothesis were researchers to examine the influence of racial composition on neighbourhood homicide rates in the 1950s compared to the 1990s. In the first instance, black neighbourhoods in Buffalo were significantly more likely to exhibit high homicide rates than white neighbourhoods, even controlling for poverty and related disadvantages. In the latter case, there was no effect of racial composition on neighbourhood homicide rates, signifying a racial invariance in the neighbourhood characteristics that are associated with homicide. Yet it is only in examining the changing demographic composition of the city, and the racial turnover of neighbourhoods in Buffalo over time, that I was able to interpret these disparate effects as a function of extreme residential segregation by race in Buffalo in the immediate postwar decades.

Perhaps the most important contribution of the present research is its emphasis on incorporating the social ecology of the city more fully in order to understand neighbourhood effects on violence. By broadening the study of within-neighbourhood homicide rates to incorporate the spatial distribution of homicide, as well as changes in that spatial distribution over time, I was able to determine the types of characteristics that made Buffalo neighbourhoods vulnerable to the diffusion of homicide. This not only

---

within that city over 50-years, employing participant observation as the methodological strategy would be unwieldy.



shows that criminological and sociological theories attempting to account for neighbourhood-level effects have omitted an important piece of the puzzle – extra-local effects – but also that urban criminologists could conceivably play a more active role in generating research that has valuable social and urban policy implications.

## **7.5 DIRECTIONS FOR FUTURE RESEARCH**

I argue that the findings of this study extend the neighbourhood effects scholarship by considering the larger social ecological context of the city and its implications for homicide, particularly as it relates to changes in the spatial distribution of homicide across one urban area over an extended historical period. In doing so, the findings prompt both additional questions and new directions for research. In this section, I outline three directions for research that build upon, but were beyond the scope of, this dissertation. First, I describe how the social ecological focus of this study could augment existing theoretical and empirical literature on homicide incidents. Second, I discuss how disaggregating homicide rates into appropriate types based on situational and sub-group features would help to determine whether different types of homicide are more or less likely to diffuse across neighbourhood boundaries. Third, I suggest that the analyses presented in this dissertation should be replicated for different cities, over different historical periods, and with different types of crime. I end this section with a caution about using ecological findings to make inferences about neighbourhood residents and the locality of homicide incidents.

### **7.5.1 Augmenting the “Patterns of Homicide” Literature with Social Ecology**

There is a long tradition of research investigating patterns and trends in homicide prompted by Wolfgang's (1958) seminal study. Various sociological theories have been utilized to describe and understand temporal trends in homicide, sub-group involvement in homicide, and situational features of homicide incidents (Gurr 1989; Hawkins 1999; Heide 1999; Lane 1989, 1997; Martinez and Lee 1999; Maxon 1999; Miethe and Regoeczi 2004; Zahn 1989). While my dissertation did not examine the situational characteristics of homicide incidents or the personal characteristics of homicide victims and offenders, such categorizations could be integrated into an historical case study of the spatial patterns of neighbourhood homicide to tease out how the spatial distribution of homicide may be dependent on the nature of the incidents.

The routine activity perspective has been productively integrated with neighbourhood-level analyses in an attempt to explain patterns of homicide (Griffiths and Tita 2003; Messner and Tardiff 1985; Tita and Griffiths 2005). However, the emphasis has been on exploring the types of locations in which homicides occur (i.e. in the home, in public places, etc.; see Messner and Tardiff 1985) or in examining the types of neighbourhoods that exhibit homicides characterized by unique victim-offender mobility patterns (see Griffiths and Tita 2003). There is a dearth of research focusing on how routine activity patterns alter the social ecology of homicide, and trends in that social ecology, across the entire urban landscape.

Cohen and Felson (1979) first introduced routine activities theory as a means of explaining how larger social and economic patterns influenced trends in property crime

rates between 1947 and 1974. They suggest that crimes are a function of the convergence in time and space of 1) motivated offenders, 2) suitable targets, and 3) the absence of capable guardians. To explain increases in property crime victimizations during the 1970s, Cohen and Felson (1979) claim that a corollary of women's entrance into the labour market was that homes were left unoccupied during the day. This created opportunities for offenders who were no longer deterred from committing crime through property guardianship. Felson (1998) later showed that routine activities theory could also explain trends in violence. Despite the focus on time and space in routine activities theory, however, "space" – or the social ecology of the city – has not been adequately integrated in empirical research.

A useful extension to the analyses I presented in this dissertation would be an examination of how changes in neighbourhood characteristics of Buffalo might have altered the possibility that offenders and victims would meet in time and space, in the absence of guardians who would serve as deterrents to offending. For instance, it is likely that as large-scale, high-rise public housing developments were built during the 1950s and 1960s in Buffalo, and shopkeepers relocated out of the East Side, the number of "eyes on the street" (Jacobs 1961) or capable guardians declined. Such changes could stimulate an increasing concentration of homicide in East Side neighbourhoods. From a routine activities approach, Miethe and Regoeczi (2004: 33) argue that

...[s]pecific changes over the last three decades in contemporary American society that may alter the nature of homicide situations include changes in leisure and work activities, youth behavioral patterns, residency patterns and interracial relations, weapons possession and distribution in urban areas, and basic production activities.

How these changes in routine activities, particularly those relevant for the city of Buffalo, might have prompted a relocation diffusion of homicide over five decades is a question for future research.

### **7.5.2 Disaggregating Homicide Rates**

Researchers have become increasingly interested in determining whether and which sociological and criminological theories are appropriate for explaining homicides disaggregated by age of the offender, by racial group, by victim-offender relationship, by motive and circumstance, by gender, and by weapon, among others (Gartner 1990; Miethe and Regoeczi 2004; Parker and Smith 1979; Tita and Griffiths 2005; Williams and Flewelling 1988; Wolfgang 1958). The results of these studies often show that either homicide rates disaggregated by demographic or situational characteristics are predicted by different factors, or that the magnitudes of important effects differ across homicide sub-types. This research tradition suggests that homicide is not a unidimensional phenomenon. Yet, in the current study, I examined aggregated neighbourhood homicide rates, independent of the nature of those events. The objective of this research was to investigate how the structural characteristics of neighbourhoods affected the distribution of total homicide rates across Buffalo neighbourhoods over time. It did not focus on specific types of homicide. I would argue that this dissertation provided an important first step in determining how and why homicide diffuses across the urban landscape, but it also prompts questions about whether homicides disaggregated by victim-offender relationship, gender, age, race, weapon, etc., may exhibit different patterns of diffusion across neighbourhood boundaries.

The expectation is that, perhaps, they would. For example, Van Wyk et al. (2003) show that neighbourhood disadvantage is important for predicting intimate partner violence, in addition to non-partner street crimes. However, the extent to which intimate partner homicides might diffuse across neighbourhood boundaries is unknown. Relying on the mechanisms presumed to be responsible for diffusion,<sup>102</sup> the nature of intimate partner homicides suggests that these are precisely the kinds of events that would *not* precipitate *like*-events in contiguous neighbourhoods. While these intra-familial disputes are affected by the neighbourhood context, such that economic strains are present and there are few social controls to deter intimate violence, it seems less intuitive that intimate partner homicides in one neighbourhood would actually stimulate intimate partner homicides in adjacent neighbourhoods. Disaggregating neighbourhood homicide rates by demographic and situational characteristics to determine what kinds of homicide are more likely to diffuse across neighbourhood boundaries, and over what length of time, would be a fruitful avenue for future research.

### **7.5.3 Generalizability: City Contexts, Historical Periods & Types of Crime**

Throughout this dissertation, I have maintained that an extended case study of neighbourhoods in one city over a period of rapid social change allowed me to introduce the larger context that is missing from much of the neighbourhood-level research. The drawback of such an approach is that I cannot assume generalizability to other cities, during other time periods, and for other types of crime. To what extent does homicide

---

<sup>102</sup> Recall that the analyses presented in this dissertation, and the diffusion literature more generally, have not adequately determined the *mechanism* by which diffusion occurs. The mechanism underlying diffusion may be a dissemination of information on violence in contiguous areas, the use of preemptive violence as a reaction to living in an area that is proximate to highly violent areas, or intra-neighbourhood disputes that prompt retaliatory actions, for example. Rather, what the literature has shown, and what I show in this dissertation, is that diffusion *does* occur across contiguous neighbourhoods in cities. I further illustrate *where* diffusion is likely to occur based on the characteristics of contiguous neighbourhoods.

exhibit a relocation diffusion over the latter half of the twentieth century in other cities, particularly cities in the South and West that have very different histories than do north-eastern industrial centres? Does the process of diffusion of homicide unfold at the same rate in other cities? Do city size, the degree of racial segregation, the dominant employment industries, and the types of urban planning initiatives that characterize its past change the rate and pattern of diffusion across the urban landscape? Do assault, theft, robbery, and other types of crime exhibit similar spatial distributions in cities, and do they diffuse in the same way that homicide did in Buffalo?

If understanding the social ecology of crime requires an in-depth historical analysis of individual cities, then accumulating information on changing spatial patterns in each city will entail significant resources devoted to analysing the generalizability of the findings that I have presented in this dissertation. Even so, these types of questions are worthy of future research.

#### **7.5.4 A Cautionary Note on Fallacies**

The essential problem for scholars who focus their research on neighbourhood effects centres on determining whether neighbourhood effects are truly *contextual* effects that induce violence or create vulnerabilities to violence; or rather, whether neighbourhood effects are essentially *compositional* effects resulting from the aggregation of residents with particular kinds of characteristics (South and Messner 2000). In the first instance, neighbourhood characteristics play a causal role in producing violence, generally through their ability to alter criminal opportunities and social controls against crime. In the second instance, neighbourhood characteristics play an essentially spurious role in predicting crime because the non-random pattern of crime across space is

produced by the non-random distribution of crime-prone individuals across space. This issue underlies the 'types of people' versus 'types of places' debate.

A direct effect between the 'types of people' living in neighbourhoods and crime rates cannot be assumed based the kinds of analyses presented in this study. Thus, neighbourhood homicide rates in Buffalo indicate *only* the number of homicides that occurred in the neighbourhood per the total residential population. Neighbourhood homicide rates do not indicate whether local residents 1) are involved in the commission of violent acts or 2) are victims of violent acts. In fact, recent research has shown that offender mobility in serious violent crimes is much more common than previously anticipated (Groff and McEwen 2004; Tita and Griffiths 2005). Thus, I was careful to interpret my analyses such that I did not assume or infer individual-level behaviours from aggregate characteristics of neighbourhoods. Such an approach is necessary to avoid committing the ecological fallacy, wherein inferences about individuals are made from knowledge of aggregate-level patterns.

## **7.6 LIMITATIONS AND RECOMMENDATIONS**

I conclude by describing a number of limitations of this study, and offer tentative recommendations for overcoming those limitations in future research. First, social disorganization is one of very few aggregate-level theories intended to explain why neighbourhoods exhibit the levels of crime and violence that they do. Studies relying on social disorganization theory have evolved to incorporate the mediating constructs presumed to link the structural characteristics of neighbourhoods to their crime rates. For instance, Sampson and Groves (1989) show that control of teenage peer groups,

organizational participation, and neighbour networks mediated the relationship between the structural characteristics of neighbourhoods (i.e., economic status, residential mobility, ethnic heterogeneity, and family disruption) and crime. In more recent work, Sampson and colleagues (1997, 1999, Morenoff et al. 2001) developed the concept of collective efficacy (a combination of social cohesion among residents and a willingness to engage in social control) as an emergent property of advantaged neighbourhoods that aids in reducing violence.

By explicitly incorporating direct measures of “social disorganization” in their models, Sampson and colleagues have encouraged those studying neighbourhood effects to be more precise about measuring social processes, instead of relying solely on social structural variables. It would have been advantageous to have been able to include social process measures at the neighbourhood-level in Buffalo to better capture local social disorganization. Unfortunately, survey data on social control, social cohesion, neighbour networks and the like are unavailable over the time frame examined in this study. Yet using five decades as the period under study allowed me to capture the diffusion of homicide as it unfolded across the city. Until such time as data on social processes are collected over many decades, researchers will be unable to incorporate these neighbourhood-level measures in a study akin to the one presented here. Tempering the seriousness of this problem is the consistent finding that these mediating variables are caused by the types of structural variables included in this study (Sampson et al. 1997; Bellair 1997). This suggests that, while not ideal, neighbourhood structural variables indirectly capture those social processes that lead to high rates of crime and violence.



Second, Buffalo is not likely to be representative of American cities more generally. As such, I have limited confidence in generalizing the findings of this study to other cities, even over the same historical period. I would recommend that future work examine cities in the South and West, both regions that typically exhibit higher homicide rates than those found in the north-east. Studies of cities in these other regions would also provide information about whether diffusion processes differ in urban centres that have experienced a growth in population between the 1950s and the end of the twentieth century. Finally, I included only the central city of Buffalo in these analyses, in part because my homicide data, collected from the Buffalo Police Department, included only homicides committed in the city proper. Extending social ecological studies to include the suburbs surrounding central cities would be advantageous, particularly as the suburbs may be distinct from the central city in terms of socioeconomic advantages. Such was the case the Buffalo. Moreover, some of the citywide changes I discussed in this study, such as 'white flight,' inherently involve the suburbs. Therefore a holistic social ecological approach should do so as well.

Third, multiple different units-of-analysis have been employed in the neighbourhood effects literature. In this study, I defined neighbourhoods as census tracts which were originally created to capture approximately 4,000 residents; others have used larger units such as 'neighbourhood clusters' which encompass nearly 8,000 residents (Sampson et al. 1997). While census tracts have been most frequently used as proxy measures of neighbourhoods, they are political administrative boundaries that may not map neatly onto the neighbourhood boundaries that residents subjectively define as their home community. In studies that are over longer time frames, the problem becomes

somewhat more acute. That is, the physical landscape of neighbourhood boundaries may shift if the urban geography is altered over time (i.e. if transportation routes or public housing developments are constructed, for instance). Yet even if such changes occur, research that extends over multiple decades must use identical measures of neighbourhood boundaries at each decade to ensure comparability in the units being examined. This is necessary as the census data from which researchers derive the structural characteristics of neighbourhoods are compiled on identical boundaries over time. This problem is unlikely to be resolved in the near future.

According to geographers, the technical term for difficulties in defining the appropriate unit-of-analysis is the 'modifiable areal unit problem' (Openshaw and Taylor 1981; Ratcliffe and McCullagh 1999). One remedy to this problem involves running models at multiple different aggregations to determine whether consistent effects are found across units. Note, however, that this approach does not necessarily solve the problem because, if neighbourhoods matter, then the 'true' neighbourhood effect may reasonably be distinct from effects at alternative levels of analysis. Nonetheless, future research efforts should be aimed at delineating boundaries that are meaningful to those living in the study neighbourhoods.

Fourth, the starting point for the period under study is, in some ways, arbitrary in historical research. Yet this issue is vitally important because the starting point that is chosen may meaningfully alter the patterns that we see. For instance, if I had chosen to study the period between the 1950s and the 1970s *or* between the 1980s and the 1990s in my examination of the diffusion of homicide across Buffalo neighbourhoods, the type of diffusion that I would have observed would have been more consistent with expansion

than relocation. It is also imperative that the period under study is long enough to capture the entire process because researchers cannot know how swiftly social processes, including but not limited to diffusion, unfold. In this study, I chose a starting point for the analysis that made sense conceptually – a turning point in the economic prosperity in Buffalo. I would recommend that researchers use conceptual or natural starting points for analyses, rather than basing their decisions on the availability of data.

Fifth, the analyses that I presented in this study were cross-sectional at five consecutive decades. Longitudinal measures of neighbourhood change and the spatial distribution of homicide at yearly intervals would allow for more nuanced and fluid measures of the social ecology of the city. While models that incorporate both temporal and spatial data in a straightforward way are currently unavailable, the neighbourhood effects literature will be richer once they are.

My final recommendation is drawn from the results of my research on the spatial distribution of urban violence in Buffalo, New York, between 1950 and the end of the twentieth century. The main thing that I hope readers take away from this dissertation is a greater understanding of the importance of directing resources at “spatially disadvantaged” African American neighbourhoods, particularly those that are economically depressed in segregated cities, to forestall the diffusion of lethal violence across their borders.

### **APPENDIX 3.I**

#### **Data Sources & Description**

The data for this dissertation come from three primary sources: the Elizabeth Mullen Bogue Files providing tract-level decennial census data for 1950 and 1960; the Neighbourhood Change Data Base providing tract-level decennial census data to normalized tract boundaries for 1970, 1980, and 1990; and Buffalo homicide data. Each of these data sources are described below.

#### **1) Elizabeth Mullen Bogue Files, 1950 and 1960 (Bogue 1975; computer files)**

The Elizabeth Mullen Bogue files (DS29: Buffalo, New York) were downloaded from the Inter-University Consortium for Political and Social Research (ICPSR), of which the University of Toronto is a member institution. These data, downloaded in ASCII format, include tract-level information on American cities for the 1940, 1950, 1960, and 1970 decennial censuses. Funded by the National Science Foundation, the National Institute of Child Health and Human Development, the United States Agency for International Development, and the Social Science Division of the University of Chicago, Dr. and Mrs. Donald Bogue keypunched cards based on information compiled from printed materials and publications authored by the Bureau of the Census. After the punchcards were computerized, they were transferred to the National Archive and Records Administration (NARA). ICPSR now houses these computer files for research purposes.

## **2) Neighborhood Change Data Base, 1970 to 1990 (GeoLytics, Inc. 2003; computer files)**

Developed in association with the Urban Institute and partially funded by the Rockefeller Foundation, the Neighborhood Change Data Base is available from GeoLytics, Inc. Using a grant from the National Consortium on Violence Research, I purchased this dataset for use in the current study. The dataset provides long form decennial census data at the tract-level from the Urban Institute's Under Class Data Base for 1970 to 1990 and the decennial census for 2000. An advantage of this dataset is that the data for 1970, 1980, 1990, and 2000 can be generated normalized to census tract boundaries at the 2000 census. All data are weighted to the 2000 boundaries, thus identical geographic units for each decade are used in the analyses. Only demographic, socioeconomic, and housing-related variables for which data were available in both the Bogue files and the NCDB were included in this study.

## **3) Buffalo Homicide Data**

The homicide data used in this dissertation are part of a larger dataset on homicide in the twentieth century collected by Rosemary Gartner and Bill McCarthy (SSHRC Grant 410-94-0756). This comprehensive dataset includes information on all homicides in Toronto, Vancouver, Seattle, and Buffalo between 1900 and 1990. To update these data through the end of the twentieth century, I collected comparable information from the Buffalo Police Department on all homicides between 1991 and 1999.<sup>103</sup> Using

---

<sup>103</sup> I would like to thank Rt. Marilyn Lanc of the Buffalo Police Headquarters for her help in accessing the Buffalo homicide data between the period that I began collection in February of 2000, until it was completed in May 2003. My sincere appreciation is also extended to past Chief of Homicide Joseph Riga and the current Chief Mark Morgan for permission to collect these data. The National Consortium on Violence Research provided a pre-doctoral fellowship that funded, in part, travel and related data collection expenses. In addition, the Department of Sociology at the University of Toronto provided a small grant to Professor Rosemary Gartner for this data collection effort. I am thankful to Rosemary Gartner for

ArcView 3.2, I geocoded the homicide incident locations so that I could link the homicides to tract-level census data from the Elizabeth Mullen Bogue files for 1950 and 1960 and the Neighborhood Change Data Base for 1970, 1980, and 1990.

The homicide data include all incidents reported to and investigated by the Buffalo Police Department between January 1<sup>st</sup> 1950 and December 31<sup>st</sup> 1999. In total, the data set includes incident-level information on 2033 homicides. There were a total of 173 homicides in the 1950s, 260 in the 1960s, 608 in the 1970s, 417 in the 1980s, and 575 in the 1990s within Buffalo's city limits and investigated by the Buffalo City Police.<sup>104</sup> For each case, demographic information on the victims and offenders (including gender, race, age, prior criminal record, number of children, marital status, etc.), situational characteristics of the homicide (including motive, circumstance, type of weapon, etc.), and case disposition outcomes, where available, were collected from police files and newspaper reports. In addition, addresses for the victim's residence, offender's residence, and incident location were collected.

Gartner and McCarthy provided a definition of homicide as "...the intentional use of force that results in a death" for the purposes of this data collection effort. In cases where evidence of intent was difficult to identify, police and coroner determinations were relied on. Legal executions, deaths of mothers or babies during/after abortions, and other negligent deaths were excluded from the data set. While the intention of harm was necessary for the offender, the victim need not have been the intended target; that is, killings of innocent bystanders in intentional shootings were included.

---

facilitating entry into the Buffalo Police Department and for assistance in collecting the remainder of the 1990s homicide data.

<sup>104</sup> Of the 2033 total homicides, only 78 (3.84 %) cases had missing or unmatched incident addresses. Table 3.4 includes only those homicides for which incident location data is available.

I made multiple trips between February 2000 and May 2003 to the Police Headquarters in Buffalo where the case files were made available to researchers on this project. Validation efforts included a comparison of our annual counts identified in the Buffalo case files with the FBI annual counts for the city, newspaper searches using Lexis-Nexis, and when possible cross-verification with coroners' reports. Finally, Buffalo newspaper archives were examined to provide additional information on the cases, as well as on court dispositions.

I have chosen to examine homicide in neighbourhoods in this study for a number of reasons. Homicide has profound consequences for the victim, the victims' family, and the larger community. Prior research has shown that neighbourhoods that are unable to protect or defend themselves from homicide tend to be areas that experience extensive disadvantage, low social control, and other social problems (Bursik 1984; Krivo and Peterson 1996; Land, McCall, and Cohen 1990; Sampson, Raudenbush, and Earls 1997). Moreover, homicides are more commonly reported in the news media than are other types of violence (Sheley and Ashkins 1981; Sorenson, Manz, and Berk 1998) which encourages the development of a negative reputation for neighbourhoods experiencing high homicide rates. Wilson and Kelling's (1982) 'broken windows' theory, while originally applied to less violent forms of disorder, speaks to the spiral of decline that results from a negative neighbourhood reputation.

Practically, homicide is an excellent measure of violence due to the consistency in definition over time (Archer and Gartner 1984). That is, the legal definition of culpable homicide did not change over time, and the definition used by the variety of data collection researchers at the Buffalo police department remained consistent for the

purposes of this project. Consistency in defining the variable of interest is important, particularly if the research has a longitudinal component. Contrast the standard definition of homicide to home invasion robberies, or car-jackings, which are relatively new concepts that do not have comparable temporal data.<sup>105</sup>

Homicide is also much more likely to be reported to the authorities than are other types of crime and violence. This means that the 'dark figure' of crime is drastically reduced in research on homicide, and that we can be fairly confident that the number of homicides reported in any given year overlaps substantially with the actual number of incidents that took place in the area.<sup>106</sup> Homicide receives a disproportionate share of police attention and is thus solved at a much higher rate than are other types of violent incidents that occur in urban areas. Finally, homicide also receives a disproportionate amount of media attention which has strong effects on individuals' perceptions of crime levels and on their fear of crime.

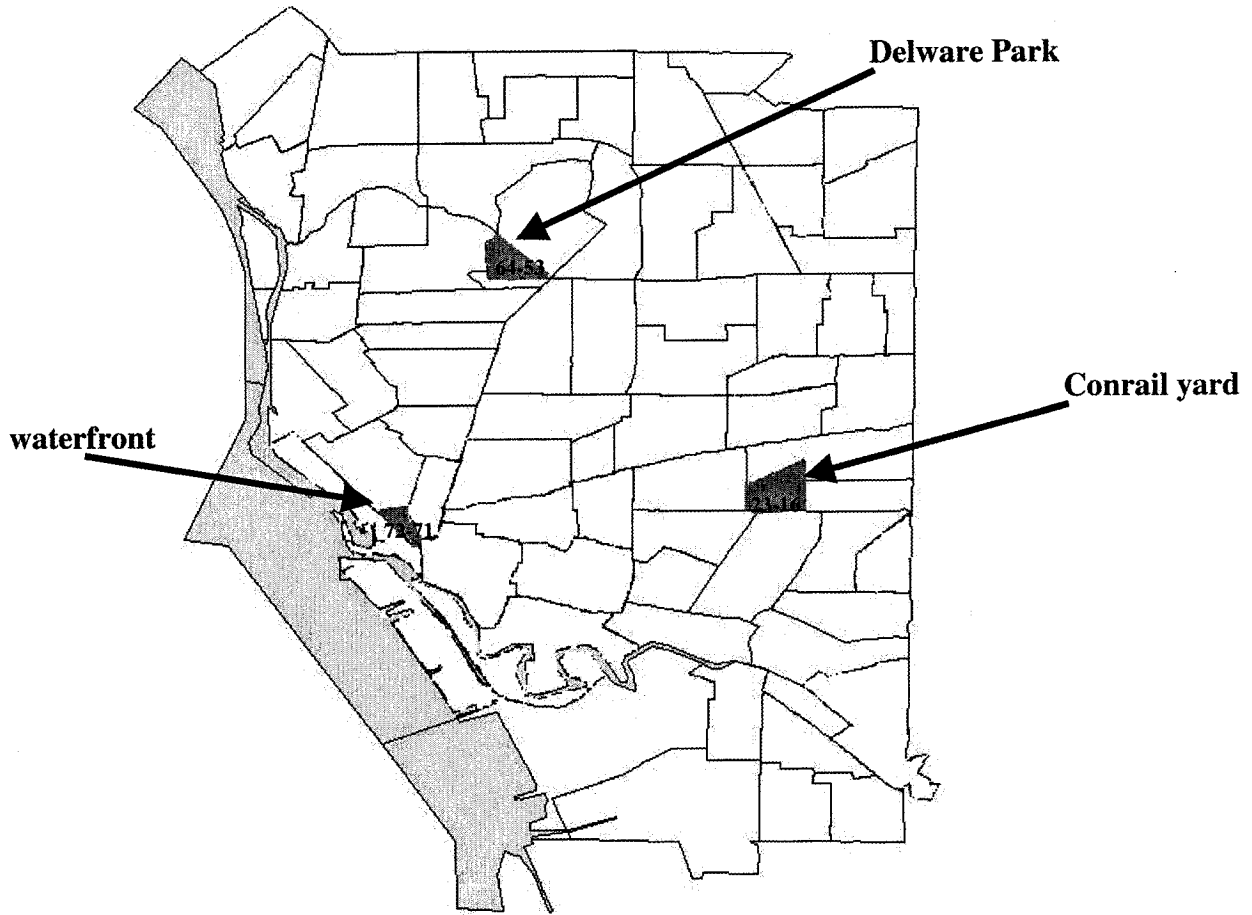
---

<sup>105</sup> Stuart Hall (1978) provides an example with the concept of 'mugging' in Britain being imported from the United States, and the resulting problems with measuring street robbery before and afterwards.

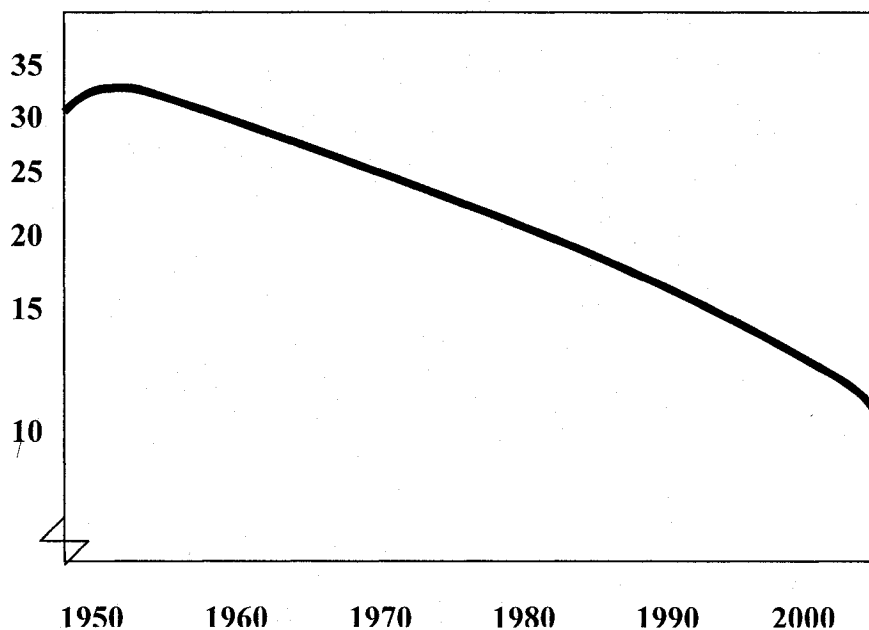
<sup>106</sup> I acknowledge that there are potential sources of underreporting captured in this data set, and that this may have changed over the time period covered in this research. For example, infant and child deaths were more thoroughly investigated and easier to detect as time went on. Further, some organized crime and/or gang-related killings are unlikely to have been captured in the data set, and the extent to which this underreporting occurred may have likewise varied over time. The larger data set includes all homicides identified by police, coroners, and the media in Buffalo between 1900 and 1999. My dissertation focuses only on the post-WWII era, which may help to reduce the likelihood of variation in the type of underreporting inherent in the data.



**APPENDIX 3.II**  
**Map of Buffalo Highlighting Tract Boundary Changes**



**APPENDIX 3.III**  
**Trend in Manufacturing Employment**  
**As a Share of Total Employment**



Source: Congressional Budget Office; Department of Labor, Bureau of Labor Statistics; Department of Commerce, Bureau of Economic Analysis. Congressional Budget Office (February 2004). "What accounts for the Decline in Manufacturing Employment?" accessed on March 9<sup>th</sup> 2005 at <http://www.cbo.gov/showdoc.cfm?index=5078&sequence=0>

### **APPENDIX 3.IV**

#### **Defining and Measuring Poverty**

In recent years, poverty research intensified in response to "...the visibility of homeless people in American cities during the early 1980s and...journalistic accounts of social pathologies in inner-city neighborhoods" (Gephart and Brooks-Gunn 1997: xiii) after a period of relative neglect during the 1970s. But the 'War on Poverty' began earlier, gaining full momentum under the Johnson administration in 1964 with the launch of America's Great Society programs. Mollie Orshansky (1963, 1965) is credited with providing the first feasible definition of the poverty line as part of a task force assembled by the Social Security Administration in 1963. The only prior usage of "poverty", defined using the 1960 Census and the 1960 Current Population Surveys (CPS), estimated that families with annual incomes below \$3,000 and unrelated individuals with incomes below \$1,500 were technically poor (Weinberg 1995; see also U.S. Bureau of the Census 1965, 1969). However, this early definition of poverty neglected to account for variations in family size, in geographic location, in living costs in rural versus urban areas, and in other characteristics. To rectify these problems, Orshansky and her colleagues defined poverty as a measure of the minimum required income to sustain an adequate nutritional diet based on a variety of factors such as family size and urban/rural location (Murray 1984). Beginning with the 1970 census, data on the number of individuals in neighbourhoods whose incomes fell below the federally established poverty line became available to researchers.

Because estimates of neighbourhood poverty in 1950 and 1960 are not readily available in the tract-level census data, I developed measures to assess the percentage of residents in severe economic distress at the tract-level. The 1960 figure I developed is

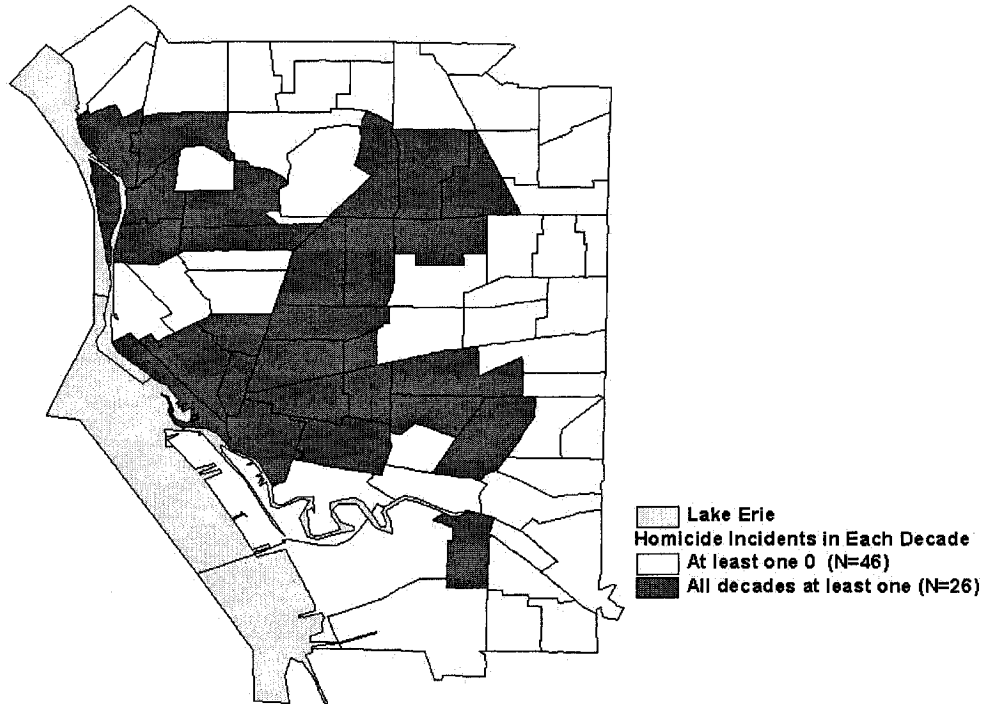
based on the early U.S. census definition of families living in poverty as families with annual incomes less than \$3,000. I derived a measure of the percentage of neighbourhood families living below the poverty line by dividing the total number of families who had incomes below this minimum threshold by the total number of families in each tract in 1960. While this estimate does not account for family size and other factors that may influence the level of economic deprivation experienced by Buffalo's residents, it provides at least a crude measure of extreme economic disadvantage.

In deciding on an appropriate measure for the 1950 census, it was necessary to assess the minimum annual income that could identify the poor population. I could not constrain the descriptive measures, such as the mean, range, and standard deviation to be similar to the 1960 figures because to do so would artificially force the variables' distribution to be similar to its distribution in later years. Instead I relied upon the U.S. Department of Labor, Bureau of Labor Statistics Consumer Price Index to assess the relative spending power of \$3,000 in 1960 for 1950. Using the Consumer Price Index calculator,<sup>107</sup> I determined that \$3,000 in 1960 was equivalent to, or had the same buying power as \$2442.57 in 1950. The 1950 Census breaks down family income measures into 14 categories ranging from 'family income less than \$500' to 'family income \$10,000 or more.' The fifth income category includes families earning between \$2000 and \$2499 in 1950. By totalling each of the categories less than and including families earning \$2000 to \$2499, I was able to calculate a crude measure of the percentage of families earning \$2499 or less annually. This captures the spending power of a similarly situated family in 1960 and allows for a comparison of poverty in Buffalo over the entire period of study.

---

<sup>107</sup> The U.S. Department of Labor, Bureau of Labor Statistics Consumer Price Index calculator is available at <http://www.bls.gov/cpi/>

**APPENDIX 4.I**  
**Map of Buffalo with 26 Neighbourhoods Experiencing One or More Homicides in Each of the Five Decades, 1950s through 1990s**



## APPENDIX 4.II

## Means and Standard Deviations for Tracts with Zero, One, and Two or More Homicides

TABLE 4.5: Between 1950 and 1959

	Zero Homicides in Tract	One Homicide in Tract	Two or More Homicides in Tract
<b>Demographic Variables</b>			
% Black † γ	0.0881 (.105)	1.6612 (3.869)	15.9292 (24.893)
% Young Population	28.2008 (4.532)	28.2216 (5.411)	29.9326 (6.423)
% Foreign Born	11.4511 (3.294)	12.9730 (3.669)	11.2872 (4.150)
<b>Socioeconomic Variables</b>			
% Completed High School (25+ years old) † γ	34.6521 (14.881)	28.8054 (15.751)	19.9661 (11.582)
% Males in Labour Force (14+ years old) γ	81.5662 (2.290)	79.4529 (11.871)	78.1757 (4.477)
% Females in Labour Force (14+ years old)	29.8692 (4.449)	30.8435 (5.197)	30.6078 (3.031)
% in Poverty † γ	26.6408 (7.675)	30.5958 (8.344)	42.0821 (12.801)
<b>Housing Variables</b>			
% Owner-Occupied Housing † γ	52.6921 (12.442)	46.6922 (11.143)	31.4642 (12.283)
% Non-White Owner-Occupied Housing † γ	0.0320 (0.044)	0.4036 (0.977)	2.7663 (4.068)
% Vacant	1.0645 (0.399)	1.1517 (0.344)	1.4263 (0.759)
% Living in Same House 1 year ago	97.8497 (0.983)	97.8873 (0.754)	97.8012 (0.692)
N	32	25	15

TABLE 4.6: Between 1960 and 1969

	Zero Homicides in Tract	One Homicide in Tract	Two or More Homicides in Tract
<b>Demographic Variables</b>			
% Black † γ	0.9524 (2.529)	0.5985 (1.369)	25.6347 (31.668)
% Young Population †	33.2541 (5.696)	31.5113 (5.032)	35.8615 (5.122)
% Foreign Born	37.2309 (8.130)	38.5417 (5.396)	31.8622 (15.685)
<b>Socioeconomic Variables</b>			
% Completed High School (25+ years old) † γ	33.3930 (15.740)	35.5240 (14.861)	22.9687 (8.572)
% Males in Labour Force (14+ years old) † γ	71.3417 (11.378)	71.9920 (7.116)	65.8124 (7.712)
% Females in Labour Force (14+ years old) †	33.2449 (8.007)	34.3428 (3.428)	31.2592 (5.368)
% in Poverty † γ	12.6353 (4.208)	11.8714 (2.976)	24.6701 (11.778)
<b>Housing Variables</b>			
% Owner-Occupied Housing † γ	54.5280 (11.582)	49.5579 (12.444)	32.9463 (16.088)
% Non-White Owner-Occupied Housing † γ	0.1846 (0.673)	0.1722 (0.445)	4.8840 (7.827)
% Vacant † γ	1.6772 (0.867)	2.3300 (1.360)	3.9390 (3.250)
% Living in Same House 5 years ago † γ	59.8091 (7.694)	57.6690 (7.509)	51.2742 (10.849)
N	27	21	24

Independent Samples T-Tests conducted between: 1) 0 versus 1 homicide [\* p<= 0.05], 2) 1 versus 2 or more homicides [† p<=0.05], and 3) 0 versus 2 or more homicides [γ p<=0.05], equal variances not assumed

TABLE 4.7: Between 1970 and 1979

	Zero Homicides in Tract	One Homicide in Tract	Two or More Homicides in Tract
<b>Demographic Variables</b>			
% Black † γ	5.2841 (15.807)	0.7582 (1.352)	20.8998 (32.116)
% Young Population	32.0557 (5.586)	30.9314 (4.982)	30.1501 (8.334)
% Foreign Born	6.5222 (2.719)	8.0542 (2.781)	7.7746 (3.826)
<b>Socioeconomic Variables</b>			
% Completed High School (25+ years old)	41.8150 (14.533)	45.0374 (12.718)	36.9512 (15.197)
% Males in Labour Force (16+ years old) † γ	78.5461 (4.853)	75.6502 (3.484)	69.9918 (10.455)
% Females in Labour Force (16+ years old) γ	42.7617 (3.363)	40.6238 (2.278)	39.5016 (6.806)
% in Poverty † γ	8.7480 (4.019)	7.8201 (2.392)	16.6731 (9.760)
<b>Housing Variables</b>			
% Owner-Occupied Housing † γ	57.4563 (11.317)	57.9900 (9.005)	38.9893 (14.537)
% Black Owner-Occupied Housing † γ	1.4135 (4.080)	0.5778 (1.269)	6.2562 (9.612)
% Vacant † γ	2.7403 (1.854)	2.2041 (1.118)	5.4325 (3.388)
% Living in Same House 5 years ago † γ	65.6989 (10.876)	64.8904 (3.904)	57.5453 (8.942)
N	12	10	50

TABLE 4.8: Between 1980 and 1989

	Zero Homicides in Tract	One Homicide in Tract	Two or More Homicides in Tract
<b>Demographic Variables</b>			
% Black † γ	9.4862 (19.424)	2.1947 (2.949)	36.2476 (36.156)
% Young Population	22.5674 (8.482)	23.9991 (4.576)	26.1692 (7.041)
% Foreign Born	6.3894 (2.927)	7.0313 (3.514)	5.4868 (3.092)
<b>Socioeconomic Variables</b>			
% Completed High School (25+ years old) γ	62.4370 (14.799)	52.1398 (13.864)	48.7859 (14.341)
% Males in Labour Force (16+ years old) †	67.3858 (12.595)	71.3036 (2.734)	63.6101 (10.758)
% Females in Labour Force (16+ years old)	42.7281 (5.958)	45.1607 (4.812)	42.4416 (8.122)
% in Poverty † γ	15.1955 (10.576)	12.2255 (5.280)	24.6173 (12.195)
<b>Housing Variables</b>			
% Owner-Occupied Housing †	48.6937 (16.113)	48.0828 (10.375)	37.9145 (16.996)
% Black Owner-Occupied Housing †	2.2593 (4.380)	1.0165 (2.221)	10.6395 (13.401)
% Vacant † γ	5.3957 (3.882)	7.2352 (4.234)	11.3966 (6.738)
% Living in Same House 5 years ago	58.4044 (13.883)	62.1754 (8.791)	57.2453 (9.393)
N	12	15	45

Independent Samples T-Tests conducted between: 1) 0 versus 1 homicide [\* p<= 0.05], 2) 1 versus 2 or more homicides [† p<=0.05], and 3) 0 versus 2 or more homicides [γ p<=0.05], equal variances not assumed

**TABLE 4.9: Between 1990 and 1999**

	Zero Homicides in Tract	One Homicide in Tract	Two or More Homicides in Tract
<b>Demographic Variables</b>			
% Black † γ	7.1008 (15.688)	2.0301 (2.234)	38.3201 (36.603)
% Young Population	23.3232 (4.966)	22.9528 (4.206)	24.2508 (6.864)
% Foreign Born	3.8068 (3.070)	5.5038 (3.467)	4.1132 (2.765)
<b>Socioeconomic Variables</b>			
% Completed High School (25+ years old)	69.2151 (9.886)	69.9065 (9.016)	63.1438 (13.149)
% Males in Labour Force (16+ years old) † γ	70.0176 (8.079)	71.0936 (5.050)	62.6088 (10.507)
% Females in Labour Force (16+ years old)	51.0479 (7.805)	55.1782 (7.179)	49.3854 (8.914)
% in Poverty † γ	18.4907 (8.111)	12.7291 (5.288)	30.2815 (13.484)
<b>Housing Variables</b>			
% Owner-Occupied Housing † γ	50.7076 (12.965)	51.7595 (9.010)	36.4625 (15.014)
% Black Owner-Occupied Housing † γ	1.7215 (4.133)	0.7408 (1.152)	10.5810 (14.066)
% Vacant † γ	7.0252 (2.823)	5.7738 (2.842)	11.5119 (8.022)
% Living in Same House 5 years ago † γ	63.3016 (8.443)	61.8422 (5.999)	55.3828 (10.325)
<b>N</b>	<b>13</b>	<b>8</b>	<b>51</b>

Independent Samples T-Tests conducted between: 1) 0 versus 1 homicide [\* p<= 0.05], 2) 1 versus 2 or more homicides [† p<=0.05], and 3) 0 versus 2 or more homicides [γ p<=0.05], equal variances not assumed



**APPENDIX 4.III**  
**Bivariate Correlations with Homicide Count and Count Categories**

**TABLE 4.10 Bivariate Correlations of Percent Foreign Born with Homicide Count and Homicide Count Categories**

	Percent Foreign Born 1950	Percent Foreign Born 1960	Percent Foreign Born 1970	Percent Foreign Born 1980	Percent Foreign Born 1990
<b>Zero Homicides<sup>γ</sup> (versus else)</b>	-.122	.100	-.138	.061	<b>-.066</b>
<b>One Homicide<sup>γ</sup> (versus else)</b>	.207	.160	.051	.174	<b>.159</b>
<b>Two Homicides<sup>γ</sup> (versus else)</b>	-.093	<b>-.257*</b>	.073	-.193	<b>-.054</b>
<b>Number of Homicides<sup>‡</sup></b>	<b>-.292*</b>	<b>-.601**</b>	<b>-.434**</b>	<b>-.259*</b>	<b>-.241*</b>

<sup>γ</sup> Dichotomous variable

<sup>‡</sup> Continuous variable

\*  $p \leq 0.05$ , \*\*  $p \leq 0.01$  (two-tailed)

**TABLE 4.11 Bivariate Correlations of Percent Young with Homicide Count and Homicide Count Categories**

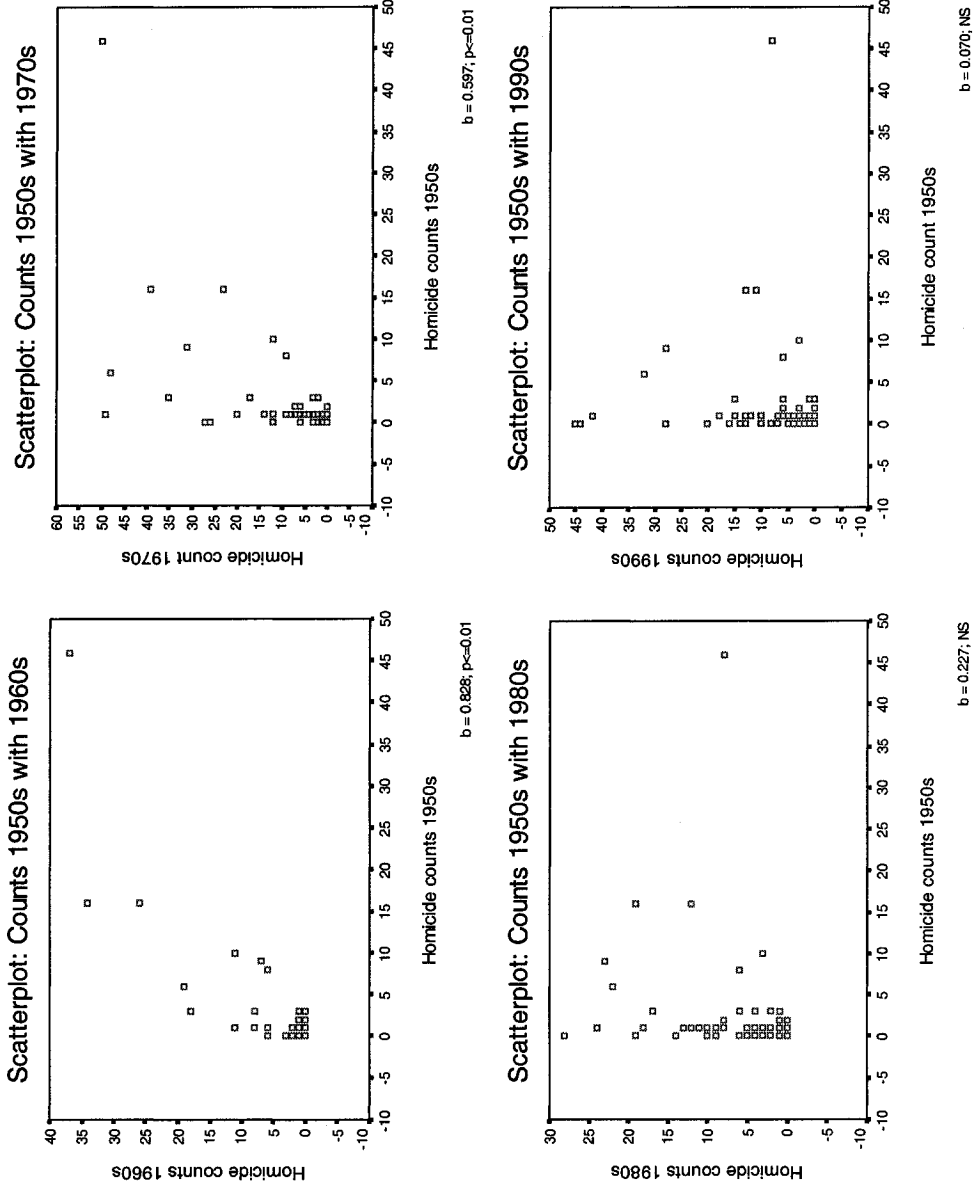
	Percent Young 1950	Percent Young 1960	Percent Young 1970	Percent Young 1980	Percent Young 1990
<b>Zero Homicides<sup>γ</sup> (versus else)</b>	-.063	-.051	.089	-.166	<b>-.046</b>
<b>One Homicide<sup>γ</sup> (versus else)</b>	-.049	<b>-.246*</b>	.019	-.083	<b>-.056</b>
<b>Two Homicides<sup>γ</sup> (versus else)</b>	.134	<b>.289*</b>	-.086	.197	<b>.078</b>
<b>Number of Homicides<sup>‡</sup></b>	<b>.123</b>	<b>.271*</b>	<b>.344**</b>	<b>.251*</b>	<b>.397**</b>

<sup>γ</sup> Dichotomous variable

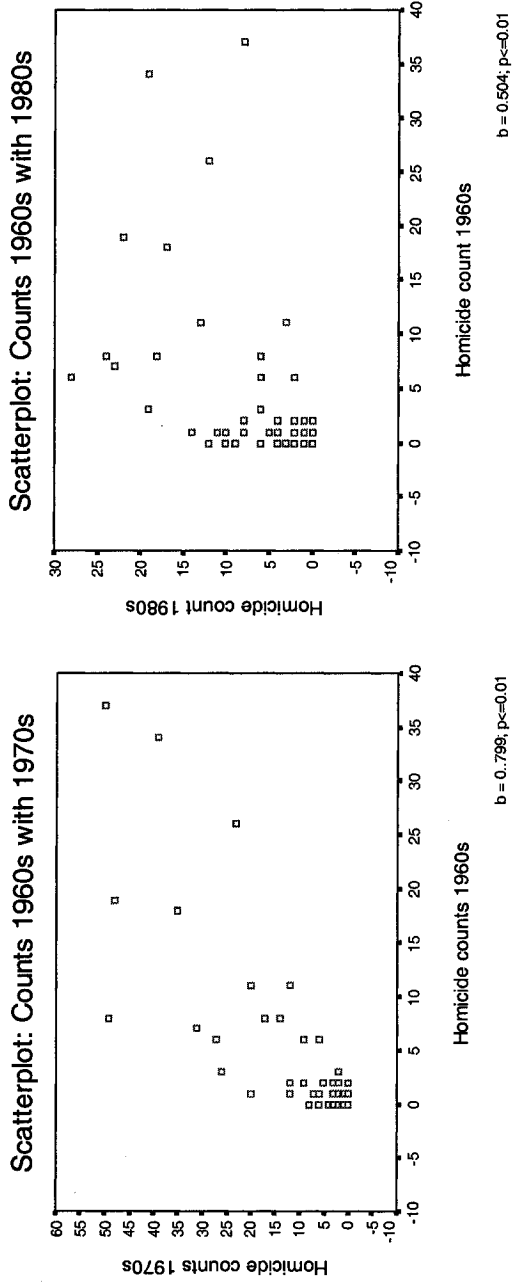
<sup>‡</sup> Continuous variable

\*  $p \leq 0.05$ , \*\*  $p \leq 0.01$  (two-tailed)

**APPENDIX 4.IV**  
**Enlarged Figures from Chapter 4**



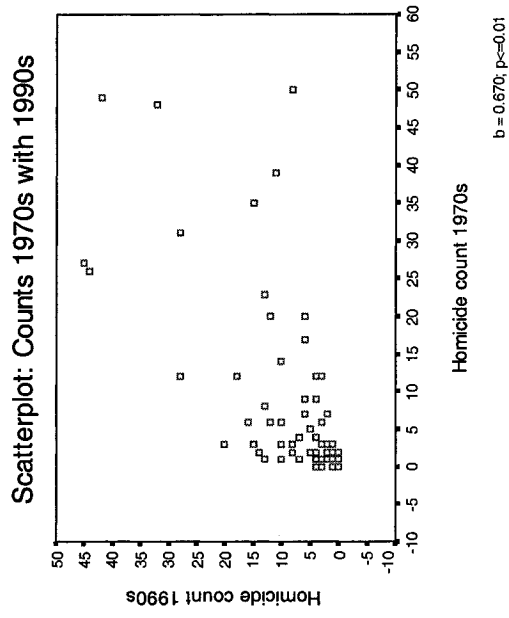
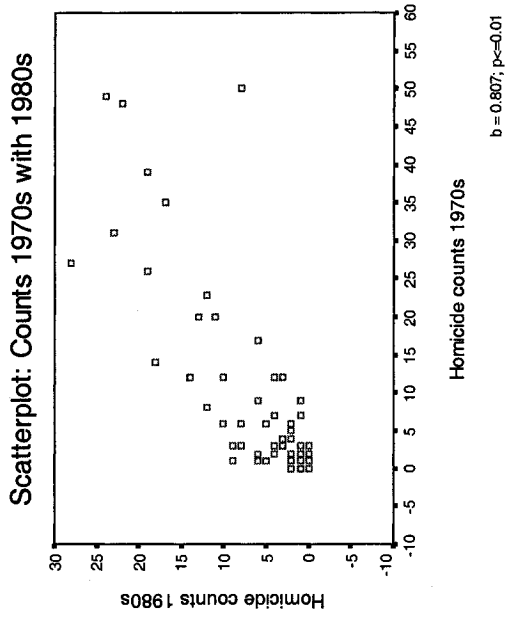
**FIGURE 4.1: Scatterplots Illustrating Bivariate Relationships of Neighbourhood Homicide Count by Decade, Buffalo, 1950s by 1960s through 1990s**



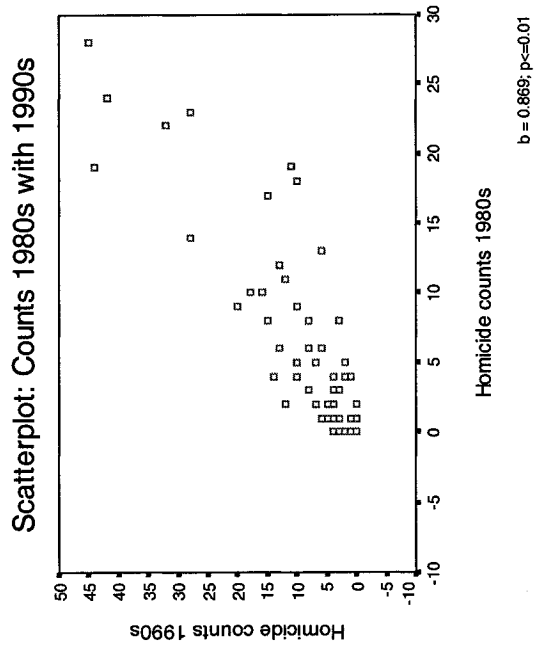
Scatterplot: Counts 1960s with 1990s

$b = 0.271; p < 0.05$

**FIGURE 4.1 continued: Scatterplots Illustrating Bivariate Relationships of Neighbourhood Homicide Count by Decade, Buffalo, 1960s by 1970s through 1990s**

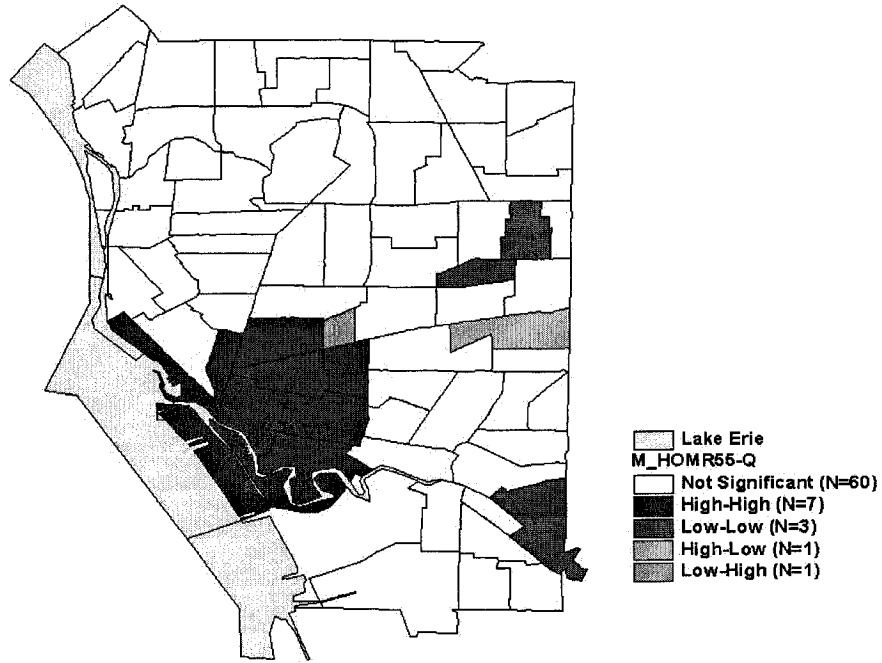


**FIGURE 4.1 continued: Scatterplots Illustrating Bivariate Relationships of Neighbourhood Homicide Count by Decade, Buffalo, 1970s by 1980s through 1990s**



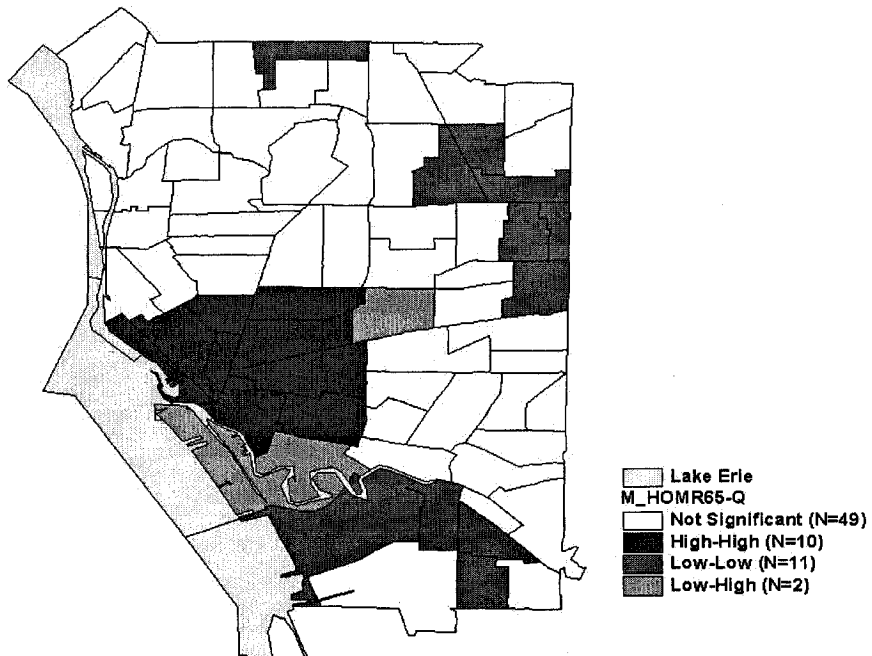
**FIGURE 4.1 continued: Scatterplots Illustrating Bivariate Relationships of Neighbourhood Homicide Count by Decade, Buffalo, 1980s by 1990s**

## Moran - Homicide Rate 1950s



Global Moran's I = 0.295\*

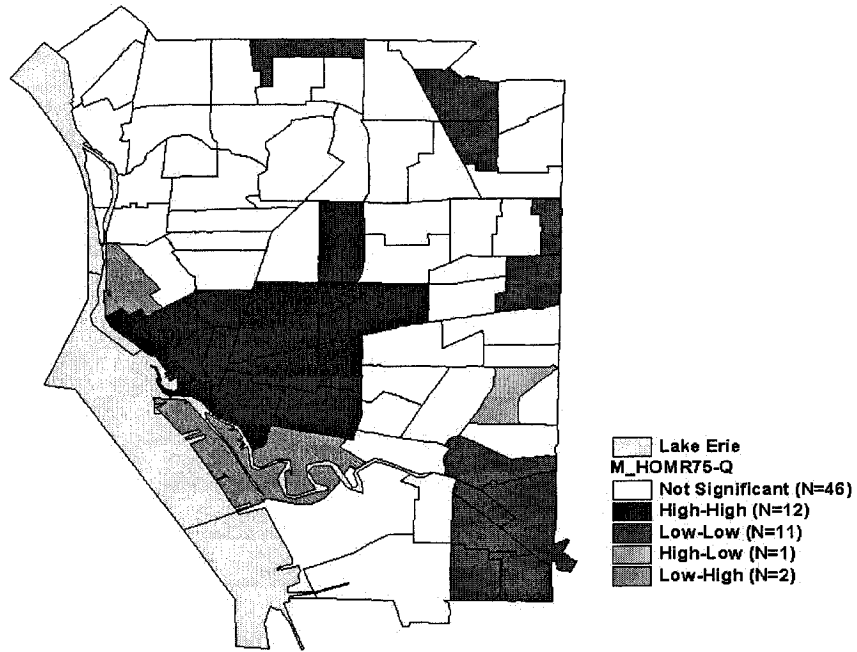
## Moran - Homicide Rate 1960s



Global Moran's I = 0.611\*

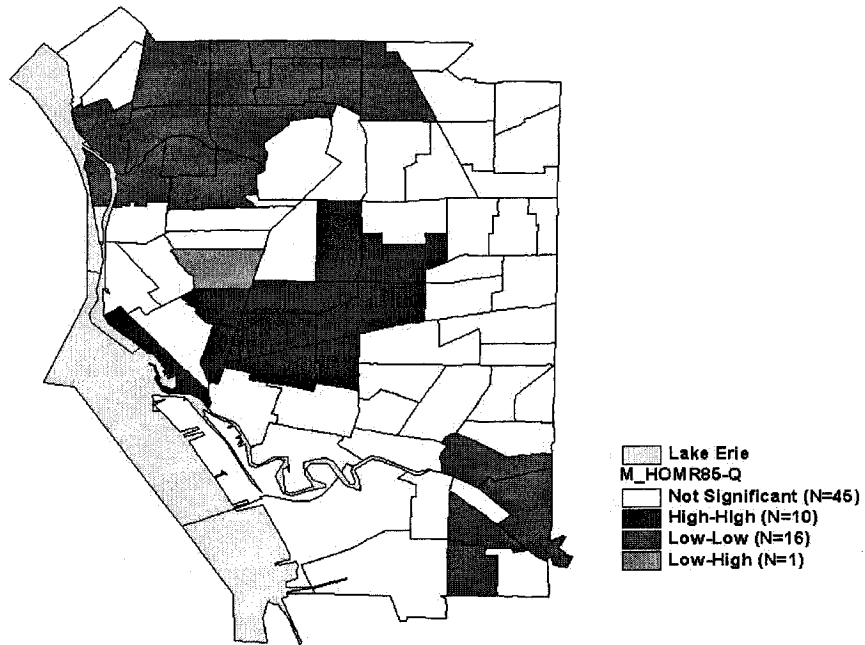
**FIGURE 4.16: Moran Scatterplot Maps of Buffalo Homicide Rates, 1950s and 1960s**

## Moran - Homicide Rate 1970s



Global Moran's I = 0.588\*

## Moran - Homicide Rate 1980s



Global Moran's I = 0.533\*

FIGURE 4.16 continued: Moran Scatterplot Maps of Homicide Rates, 1970s and 1980s

## Moran - Homicide Rate 1990s

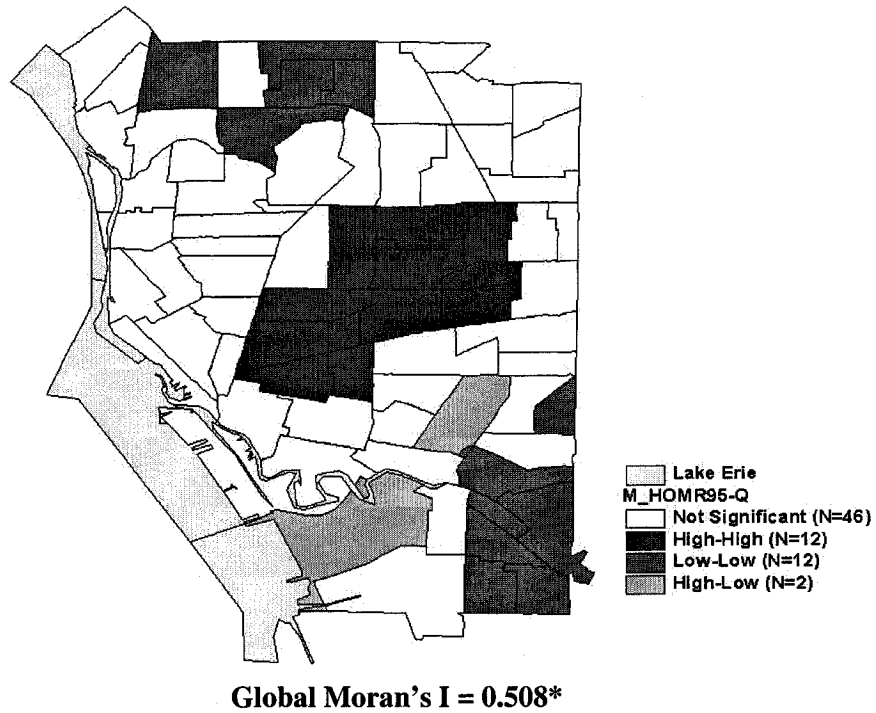
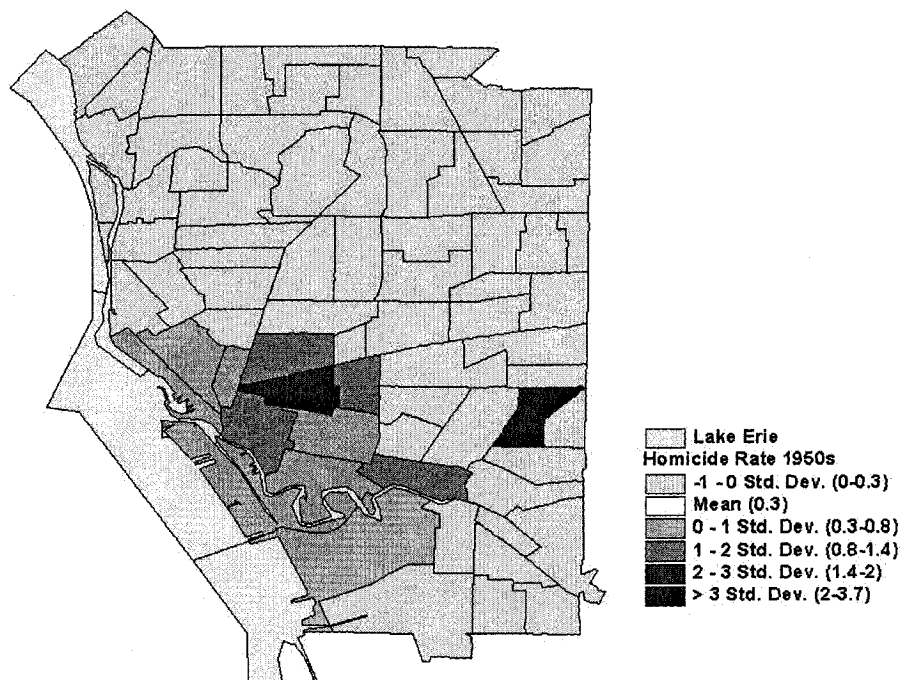


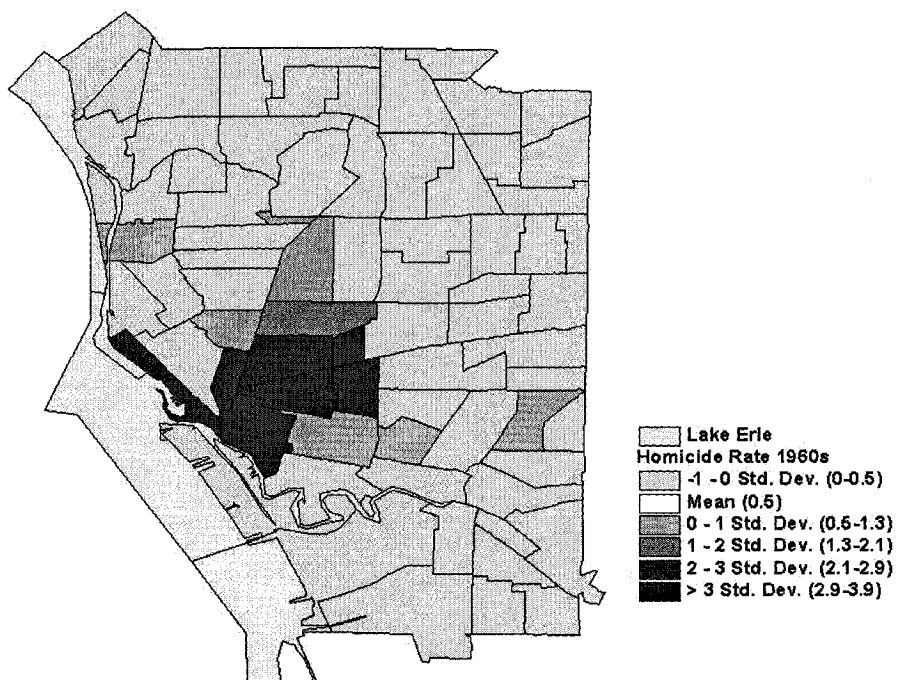
FIGURE 4.16 continued: Moran Scatterplot Maps of Buffalo Homicide Rates, 1990s



## Homicide Rate 1950s

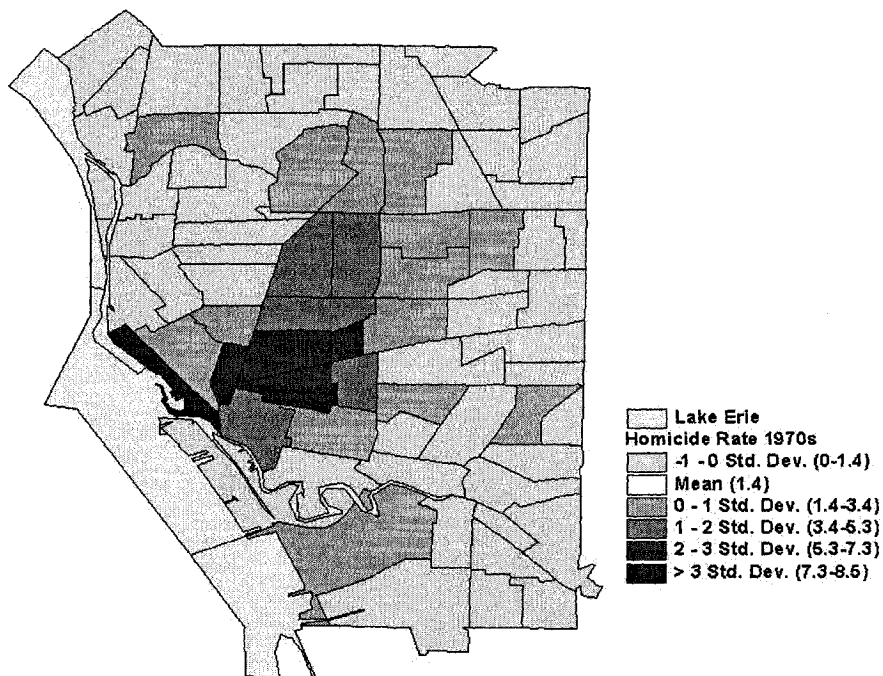


## Homicide Rate 1960s

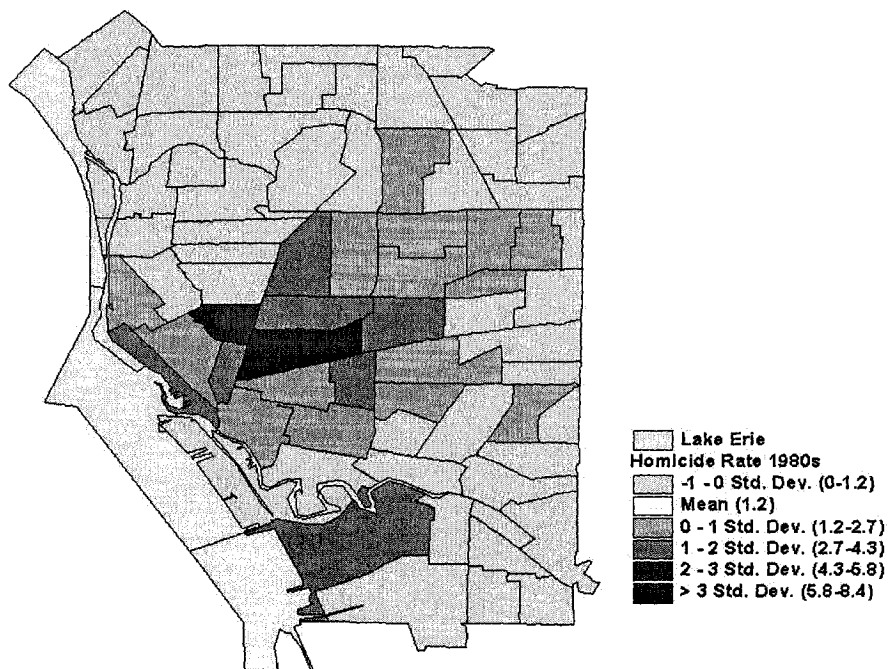


**FIGURE 4.17: Homicide Rate in Tract in Standard Deviation Units for Buffalo, 1950s and 1960s**

## Homicide Rate 1970s

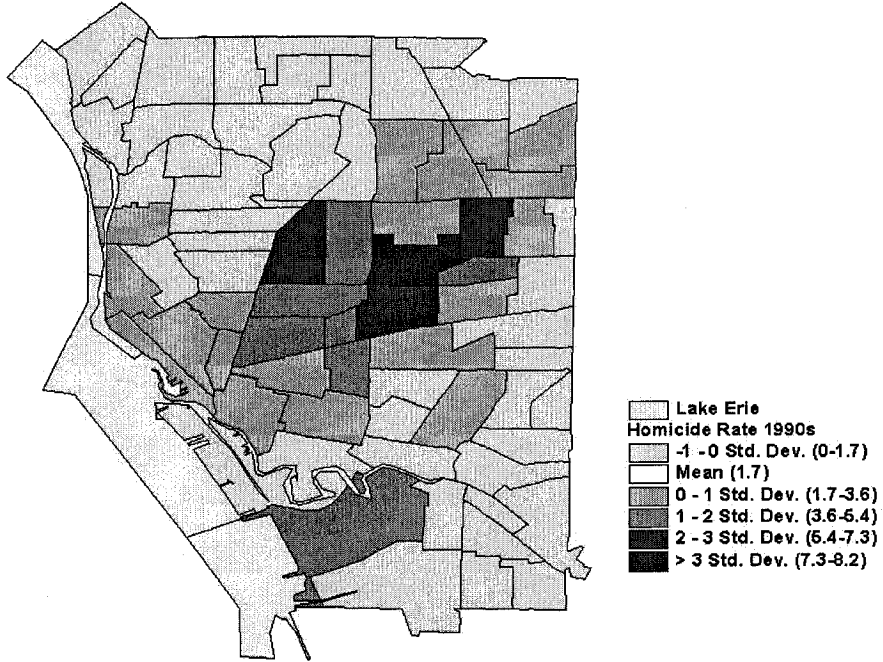


## Homicide Rate 1980s



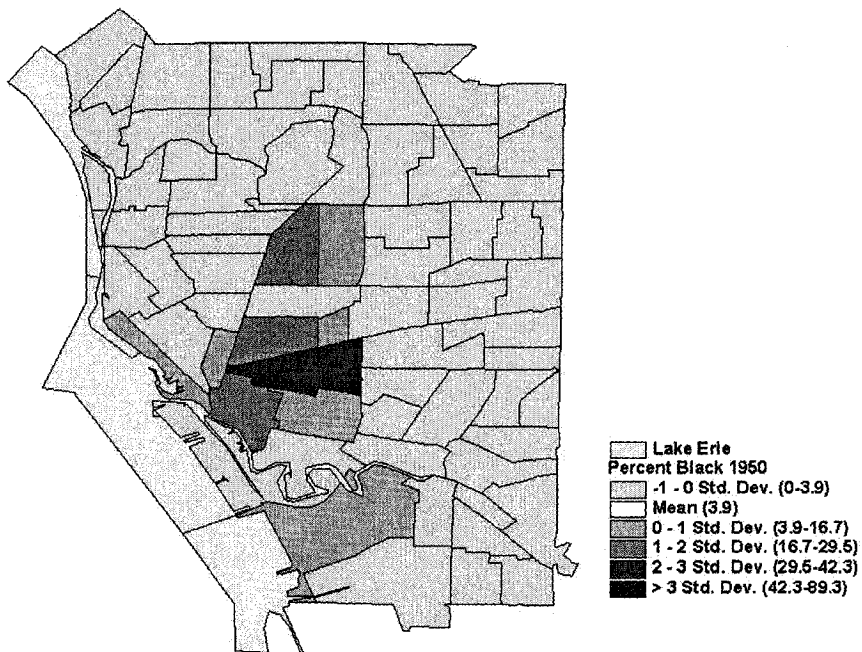
**FIGURE 4.17 continued: Homicide Rate in Tract in Standard Deviation Units for Buffalo, 1970s and 1980s**

# Homicide Rate 1990s

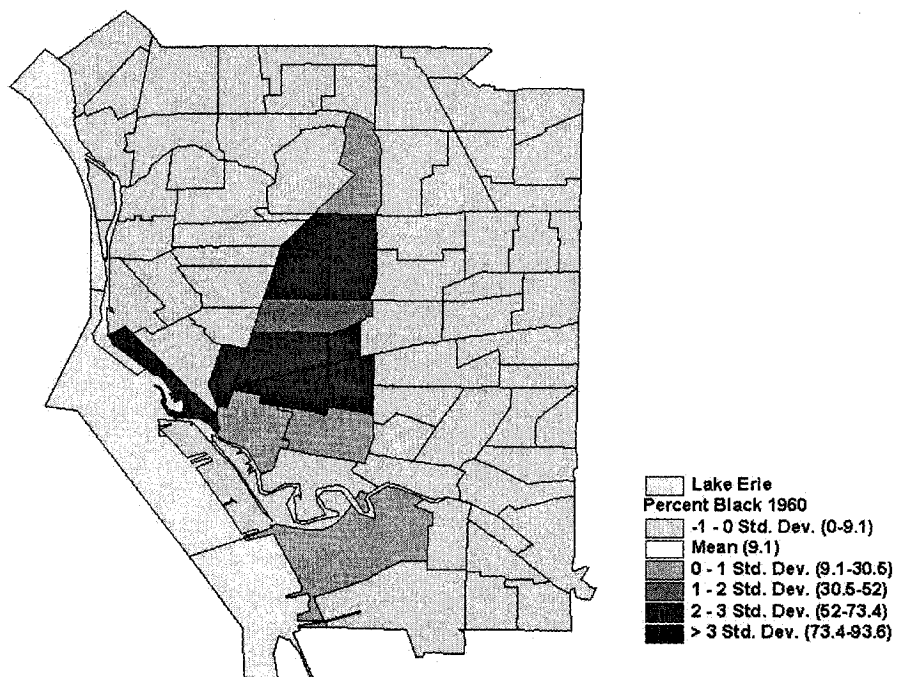


**FIGURE 4.17 continued: Homicide Rate in Tract in Standard Deviation Units for Buffalo, 1990s**

## Percent Black 1950

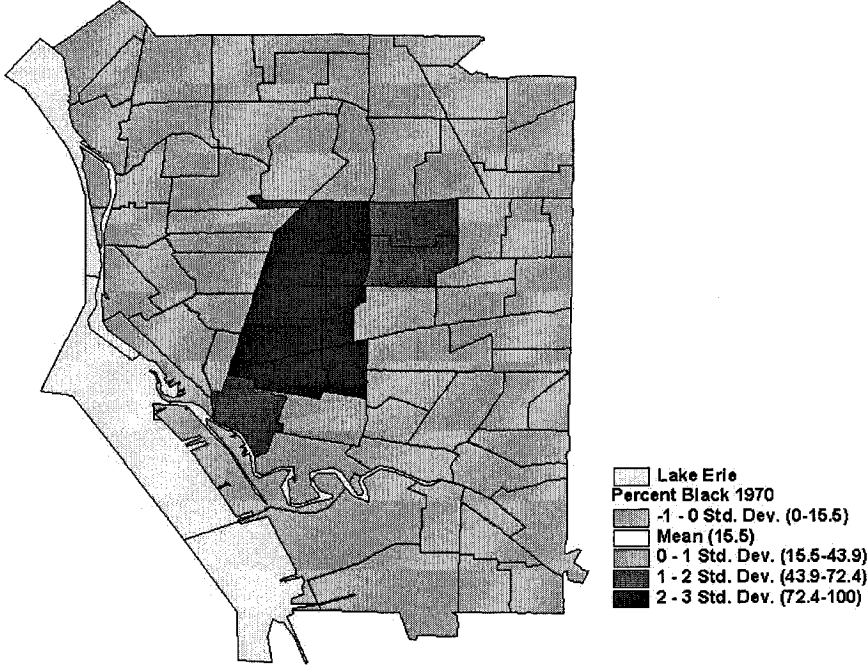


## Percent Black 1960

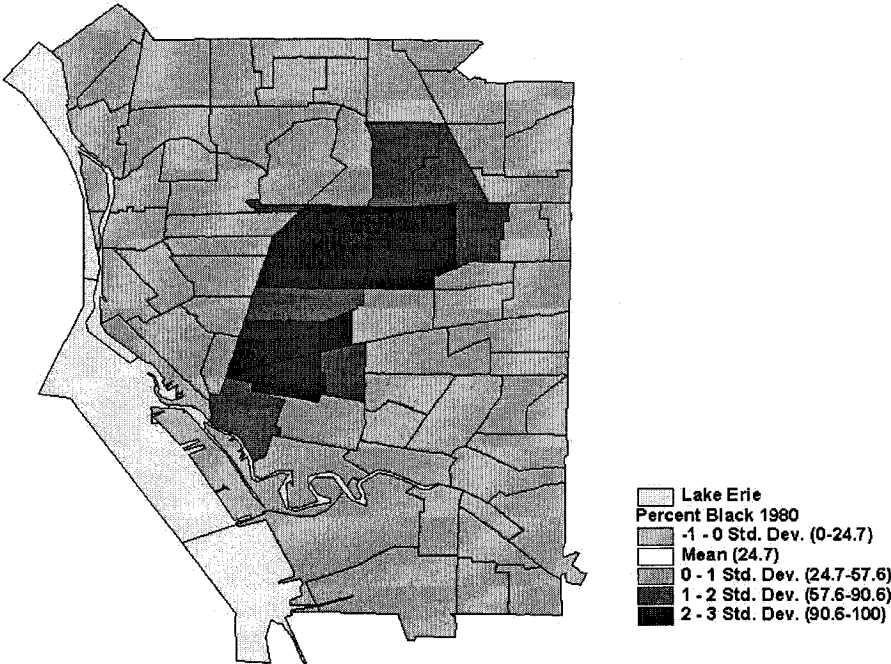


**FIGURE 4.18: Percent Black in Tract in Standard Deviation Units for Buffalo, 1950 and 1960**

# Percent Black 1970

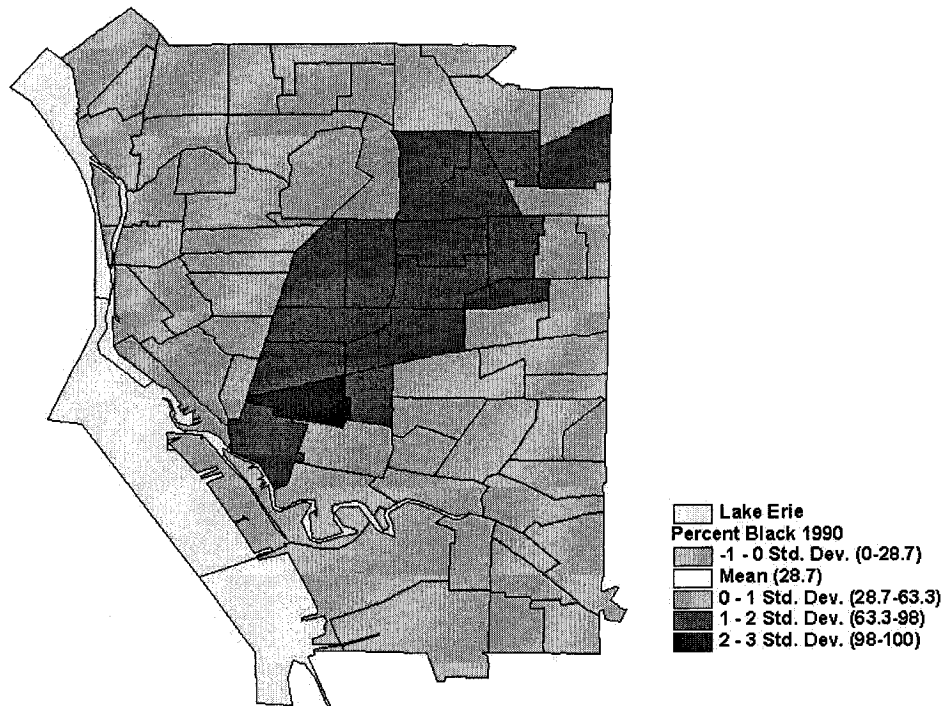


# Percent Black 1980



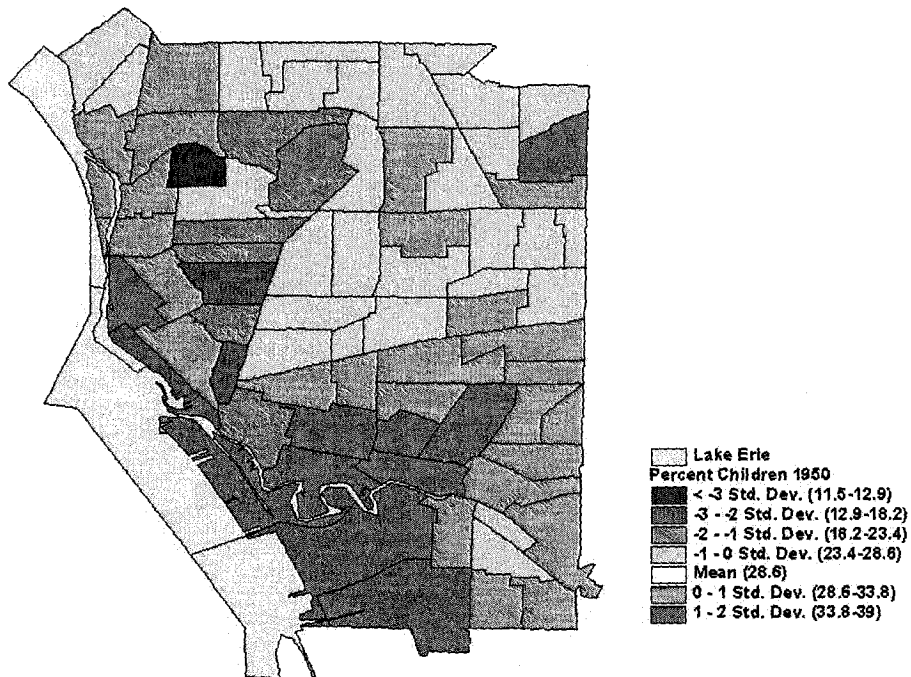
**FIGURE 4.18 continued: Percent Black in Tract in Standard Deviation Units for Buffalo, 1970 and 1980**

## Percent Black 1990

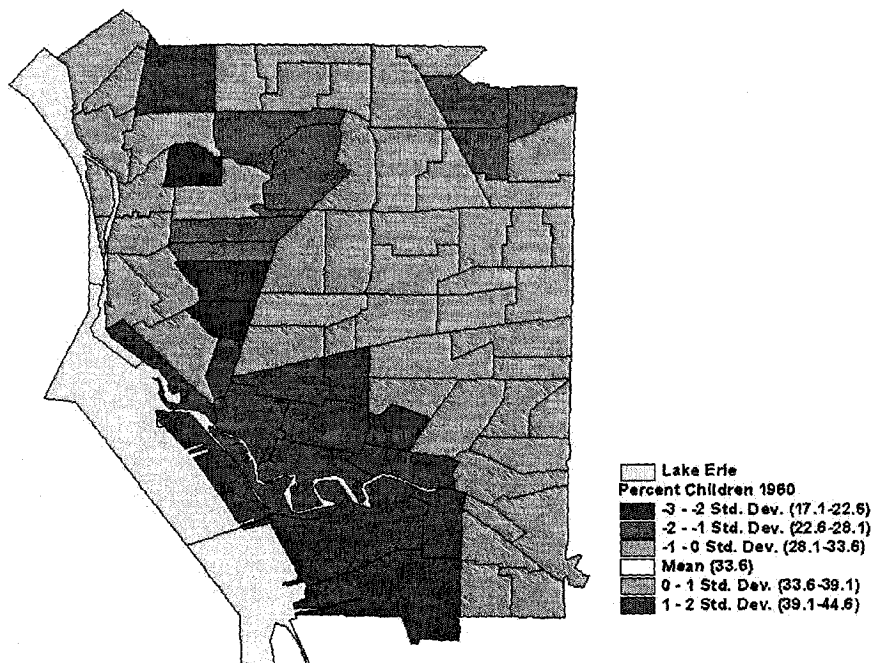


**FIGURE 4.18 continued: Percent Black in Tract in Standard Deviation Units for Buffalo, 1990**

## Percent Young 1950

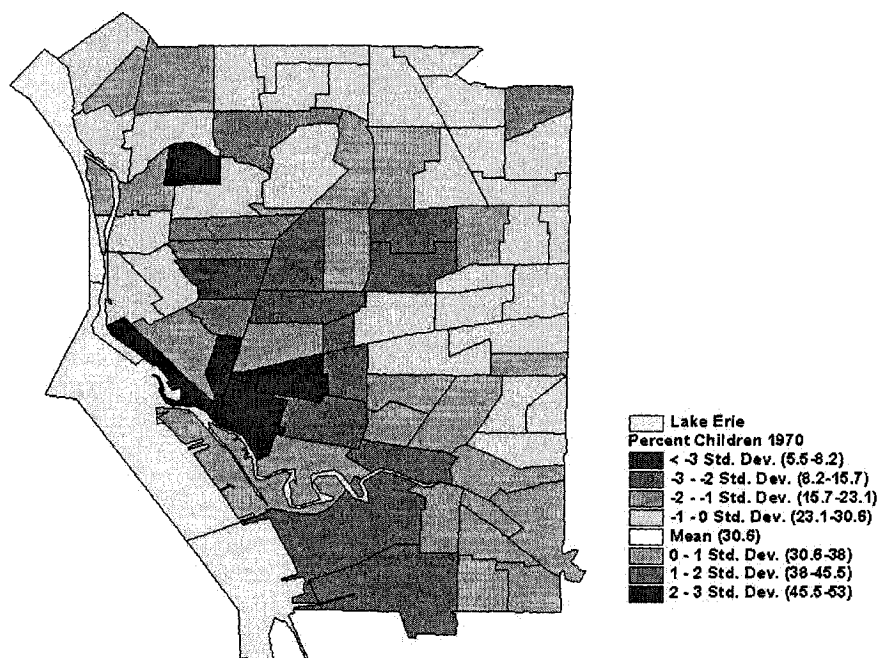


## Percent Young 1960

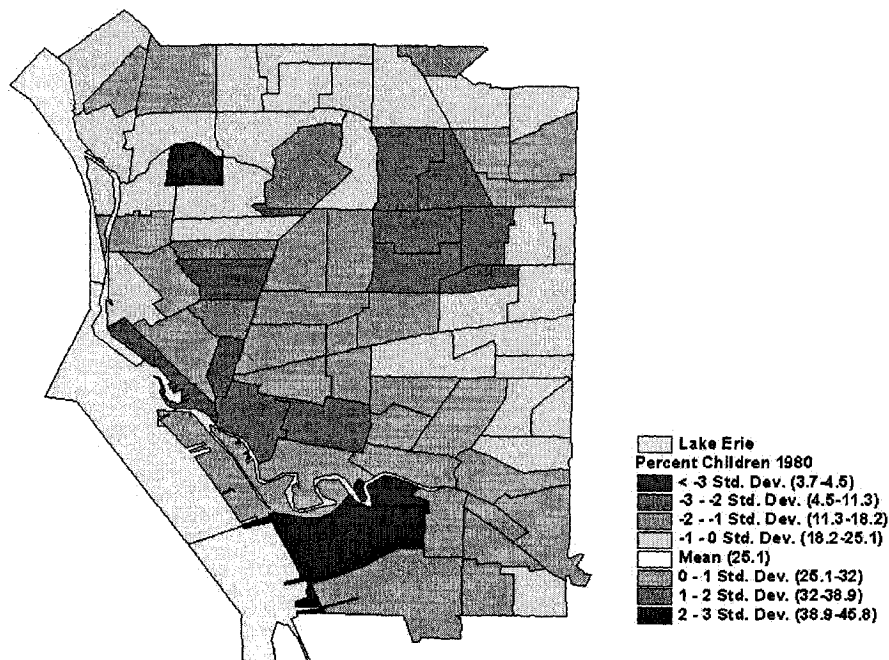


**FIGURE 4.19: Percent Young Population in Tract in Standard Deviation Units for Buffalo, 1950 and 1960**

## Percent Young 1970



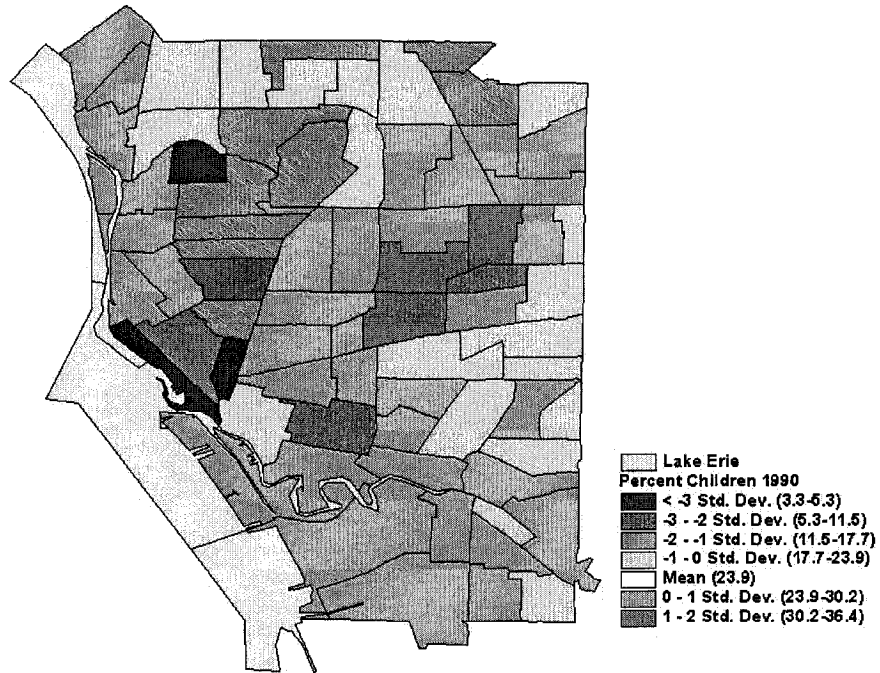
## Percent Young 1980



**FIGURE 4.19 continued: Percent Young Population in Tract in Standard Deviation Units for Buffalo, 1970 and 1980**

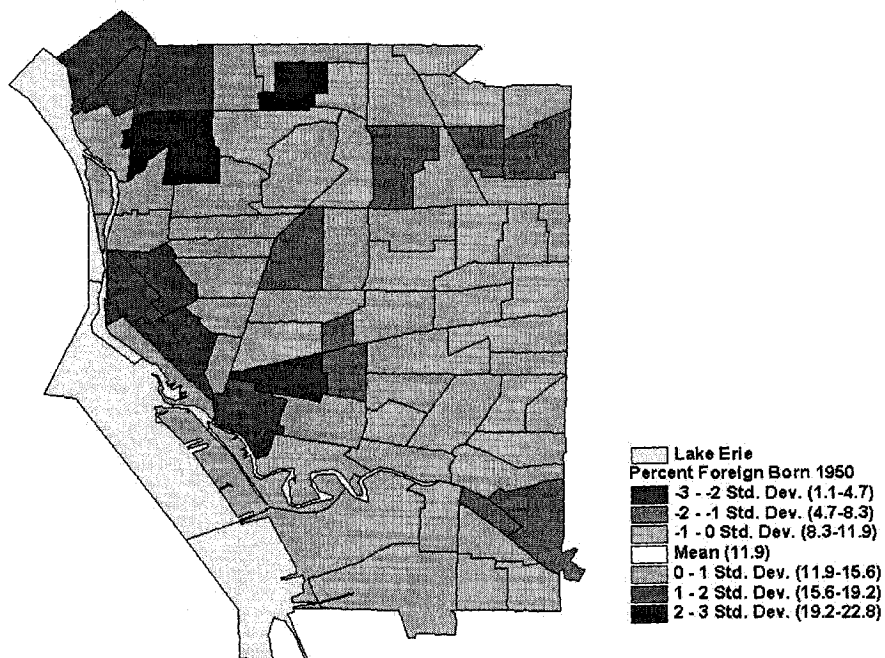


## Percent Young 1990

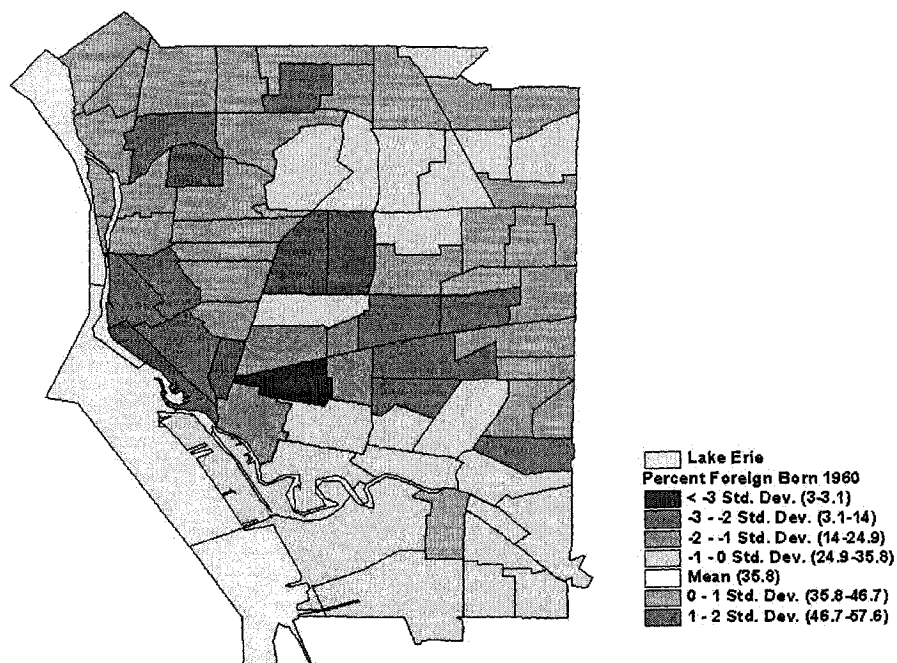


**FIGURE 4.19 continued: Percent Young Population in Tract in Standard Deviation Units for Buffalo, 1990**

## Percent Foreign Born 1950

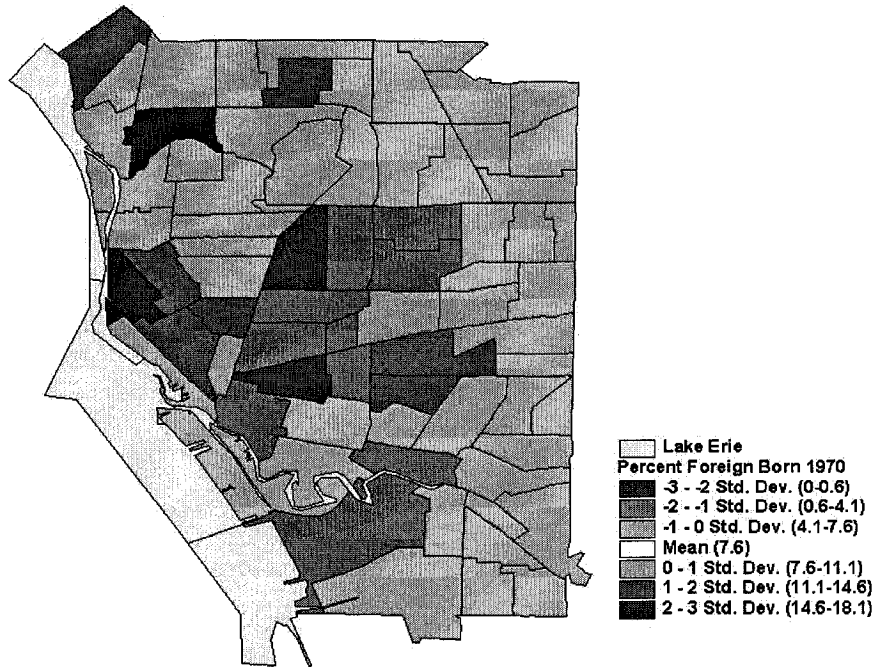


## Percent Foreign Born 1960

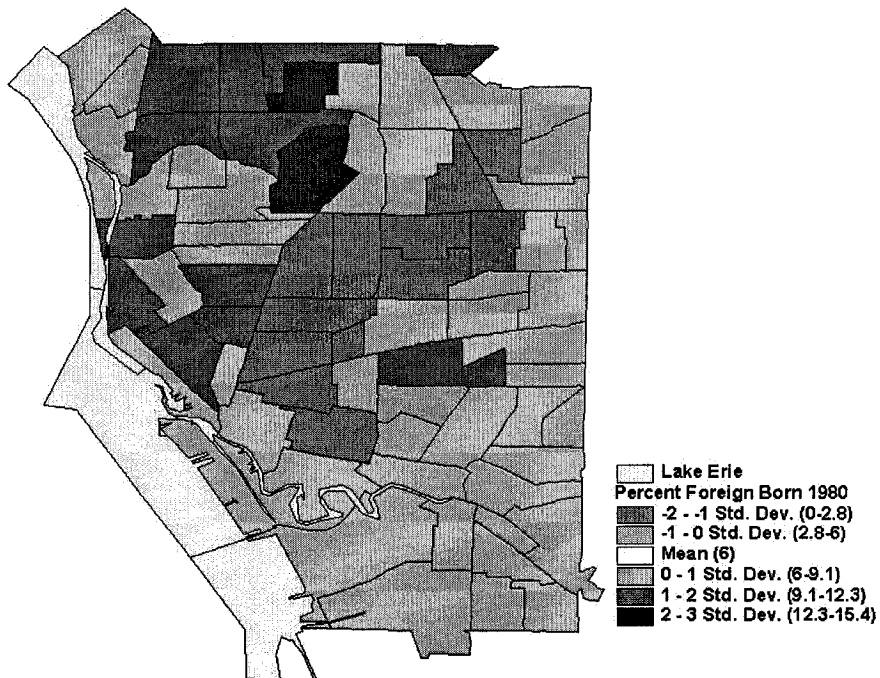


**FIGURE 4.20: Percent Foreign Born in Tract in Standard Deviation Units for Buffalo, 1950 and 1960**

# Percent Foreign Born 1970

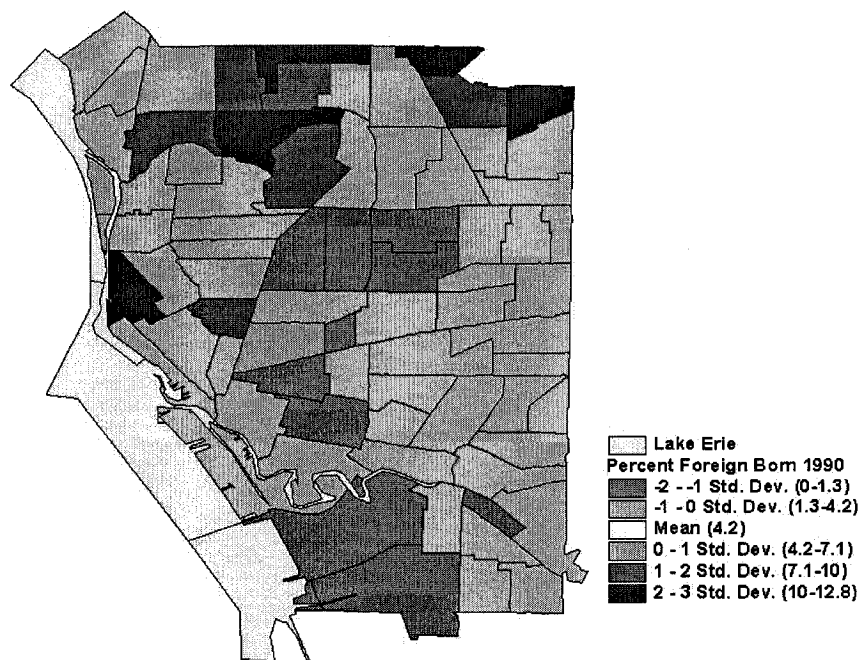


# Percent Foreign Born 1980



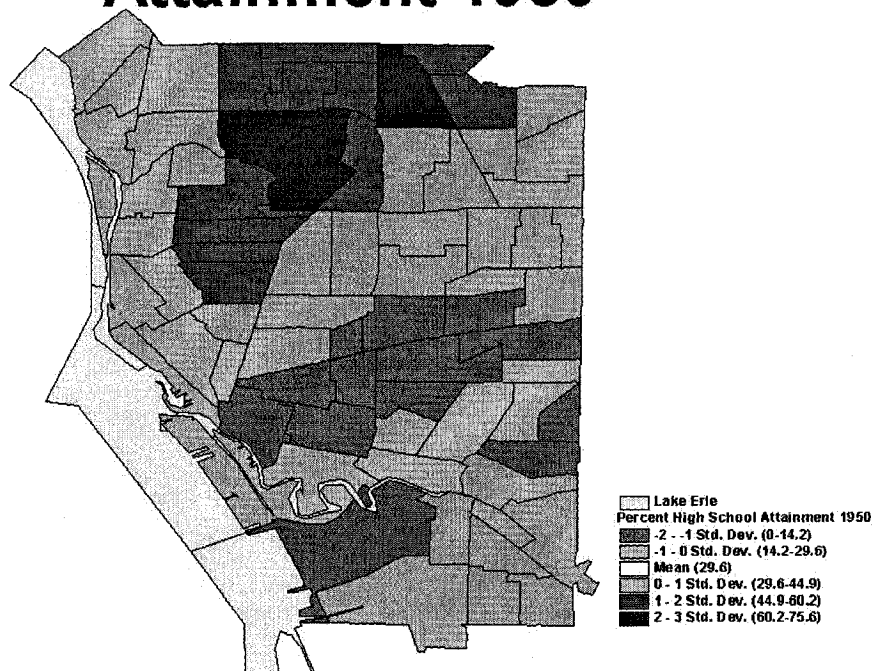
**FIGURE 4.20 continued: Percent Foreign Born in Tract in Standard Deviation Units for Buffalo, 1970 and 1980**

## Percent Foreign Born 1990

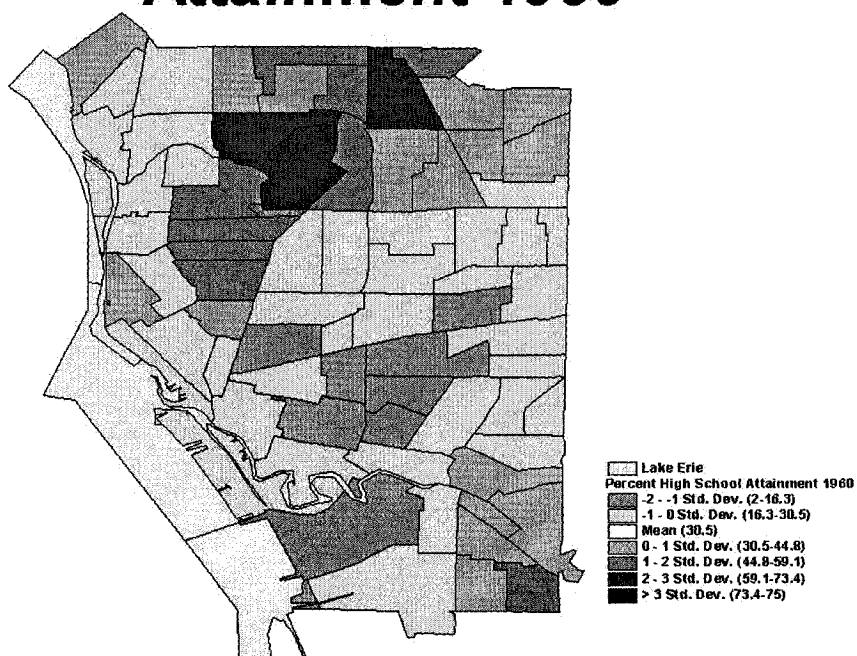


**FIGURE 4.20 continued: Percent Foreign Born in Tract in Standard Deviation Units for Buffalo, 1990**

## Percent High School Attainment 1950

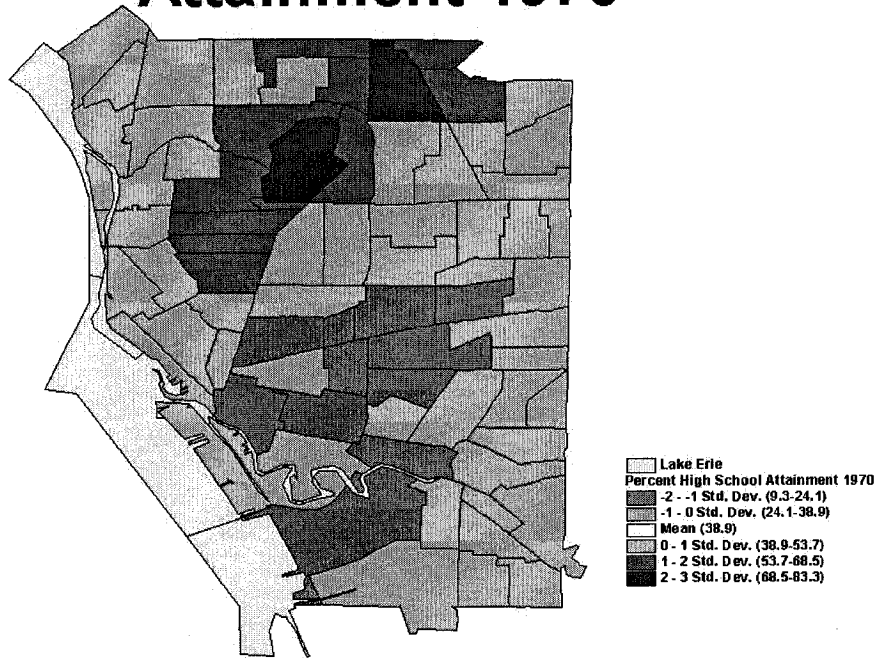


## Percent High School Attainment 1960

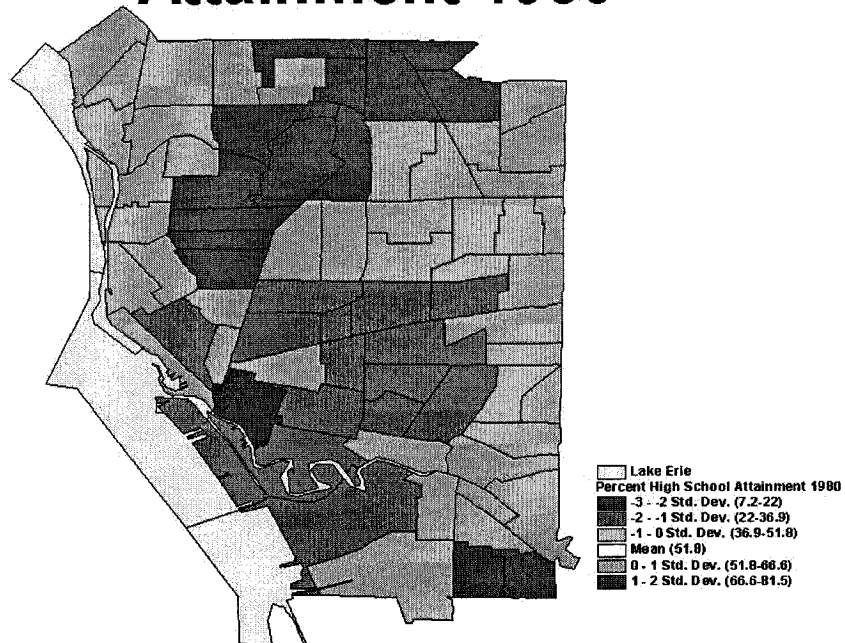


**FIGURE 4.21: Percent High School Attainment in Tract in Standard Deviation Units for Buffalo, 1950 and 1960**

## Percent High School Attainment 1970

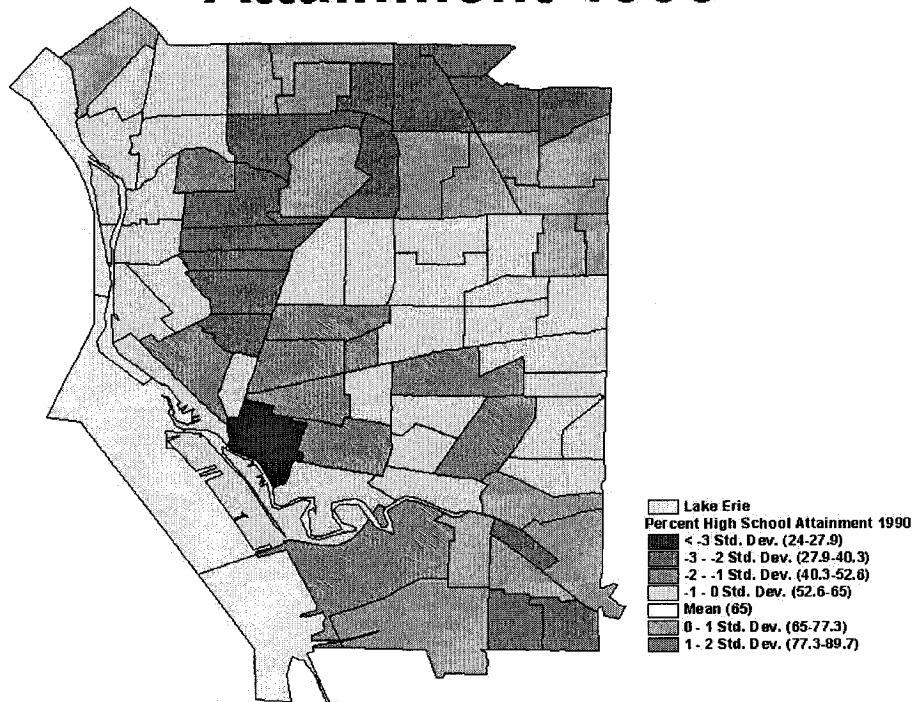


## Percent High School Attainment 1980



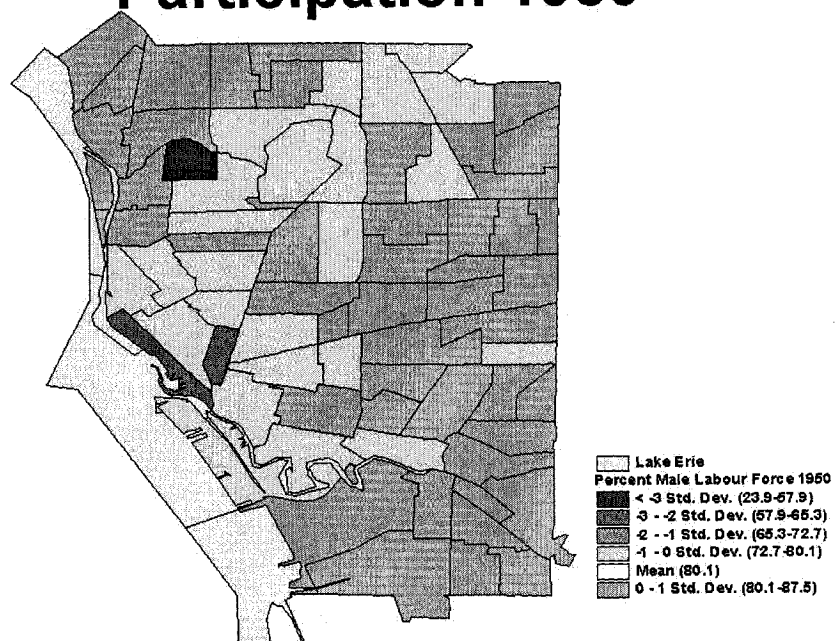
**FIGURE 4.21 continued: Percent High School Attainment in Tract in Standard Deviation Units for Buffalo, 1970 and 1980**

## Percent High School Attainment 1990

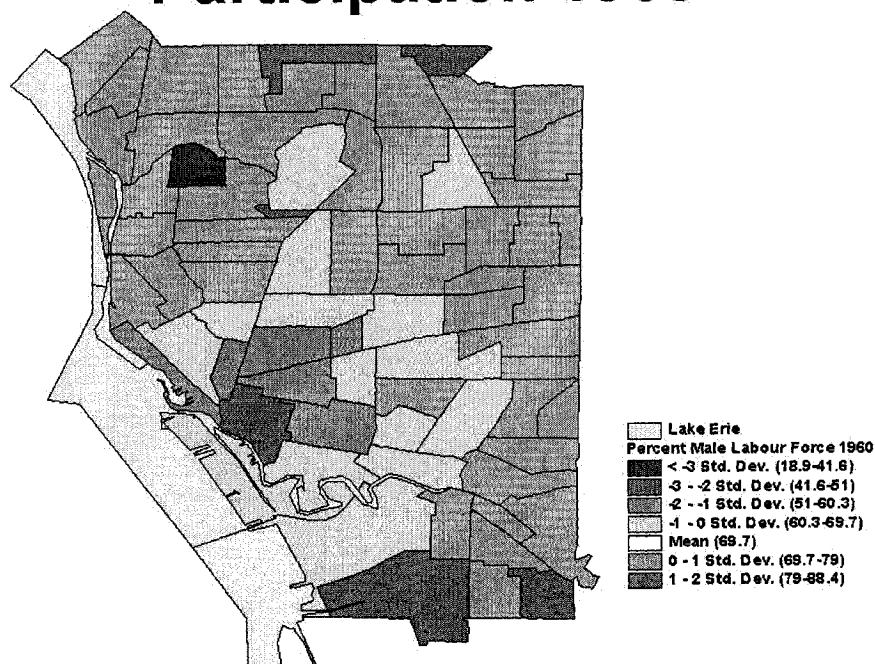


**FIGURE 4.21 continued: Percent High School Attainment in Tract in Standard Deviation Units for Buffalo, 1990**

## Percent Male Labour Force Participation 1950



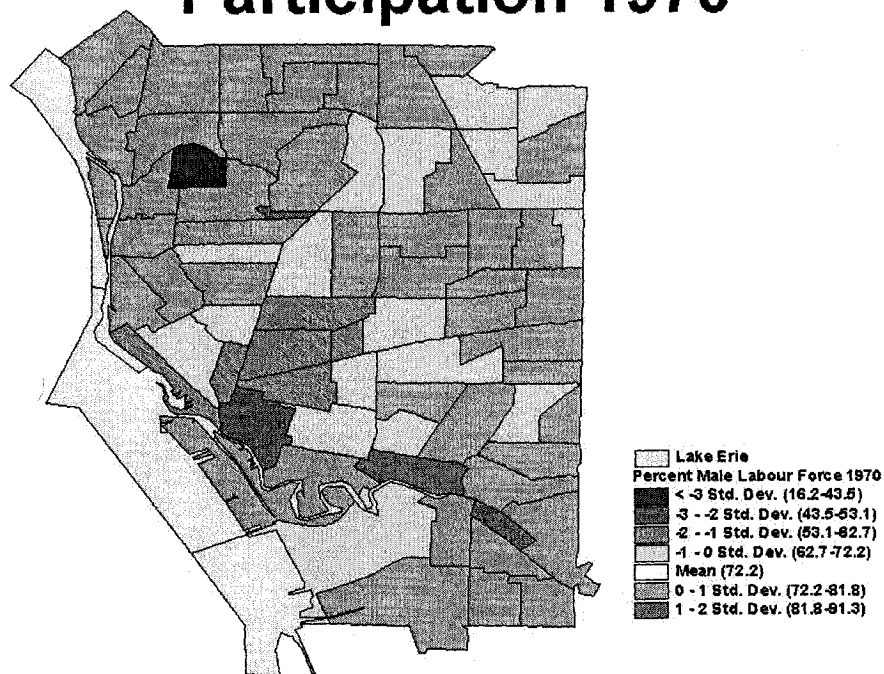
## Percent Male Labour Force Participation 1960



**FIGURE 4.22: Percent Males in the Labour Force in Tract in Standard Deviation Units for Buffalo, 1950 and 1960**



## Percent Male Labour Force Participation 1970



## Percent Male Labour Force Participation 1980

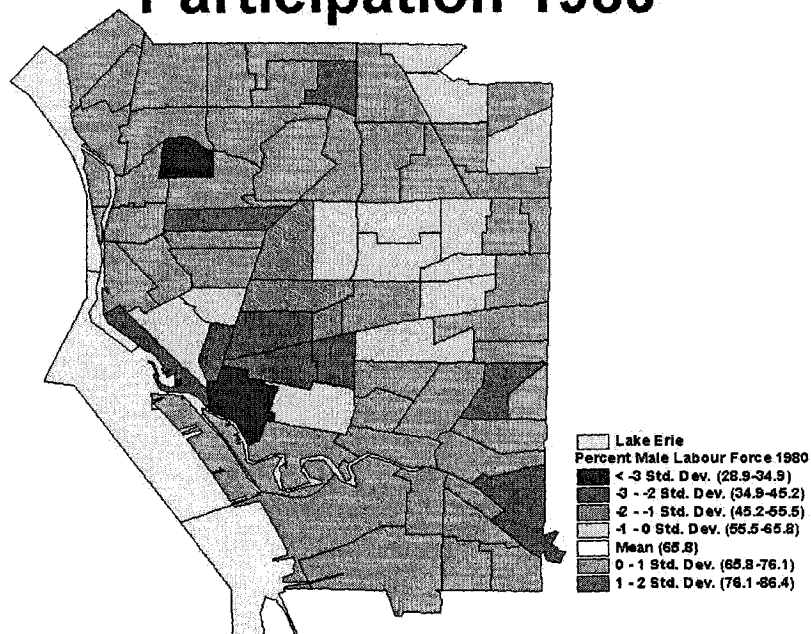
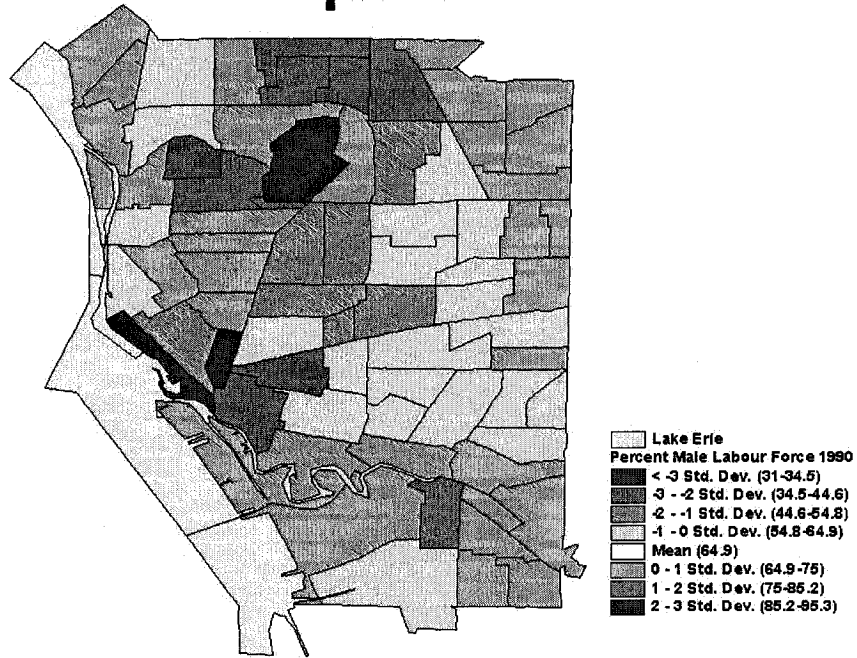


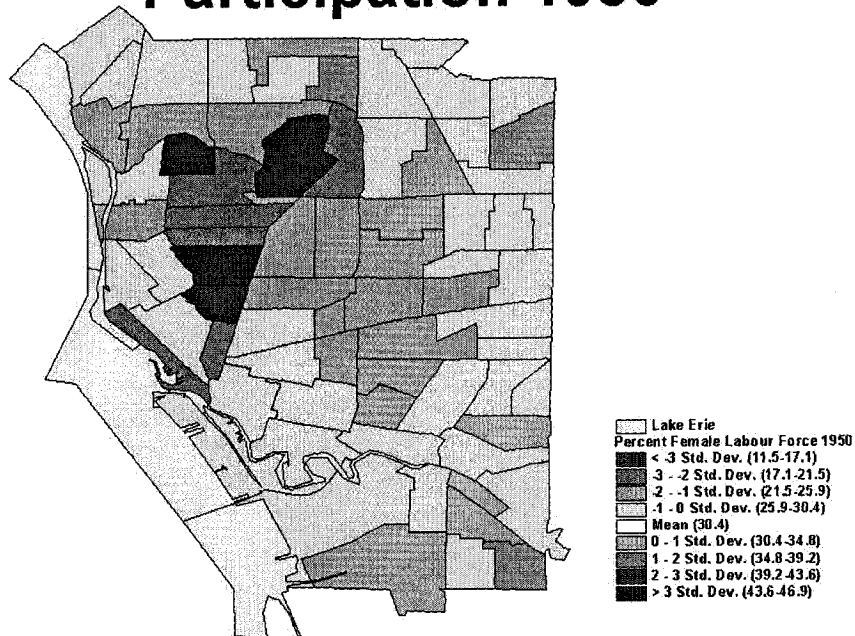
FIGURE 4.22 continued: Percent Males in the Labour Force in Tract in Standard Deviation Units for Buffalo, 1970 and 1980

## Percent Male Labour Force Participation 1990

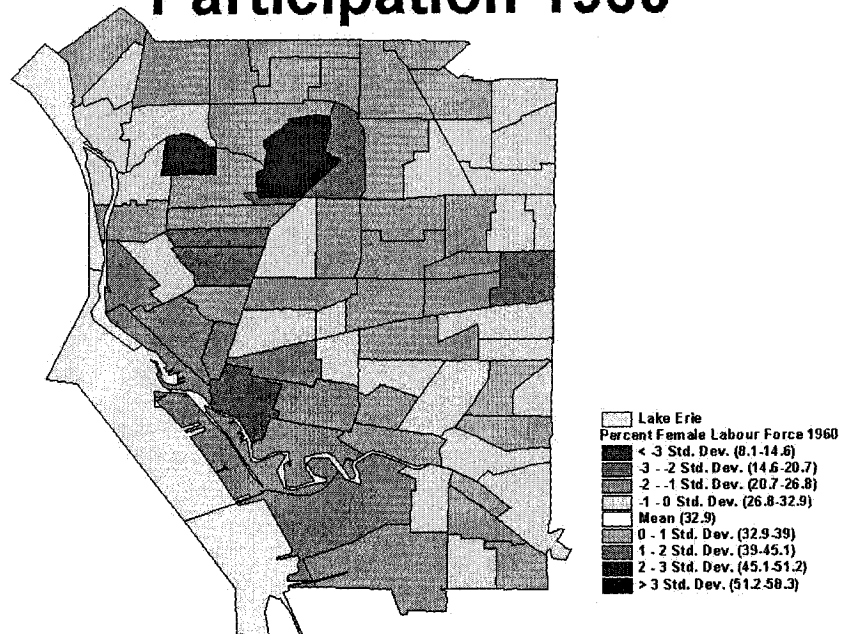


**FIGURE 4.22 continued: Percent Males in the Labour Force in Tract in Standard Deviation Units for Buffalo, 1990**

## Percent Female Labour Force Participation 1950

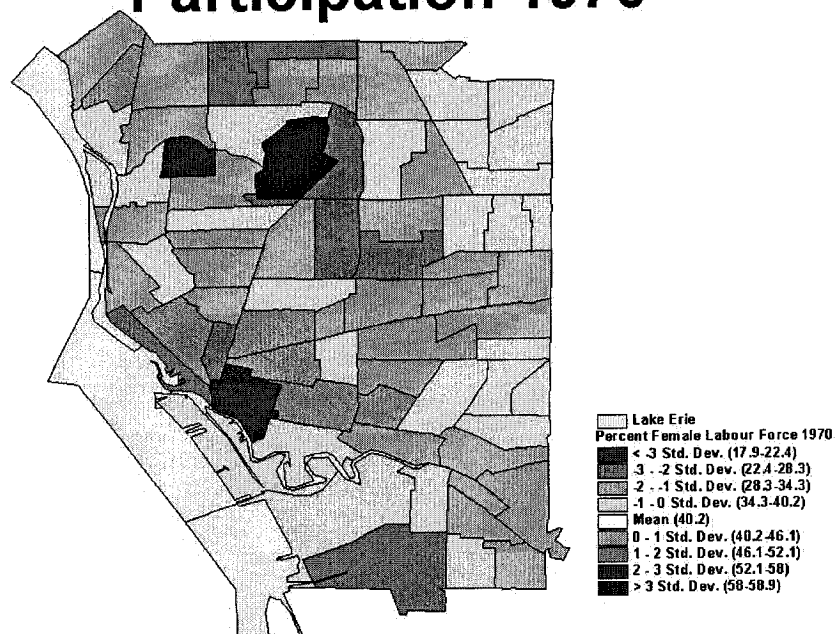


## Percent Female Labour Force Participation 1960



**FIGURE 4.23: Percent Females in the Labour Force in Tract in Standard Deviation Units for Buffalo, 1950 and 1960**

## Percent Female Labour Force Participation 1970



## Percent Female Labour Force Participation 1980

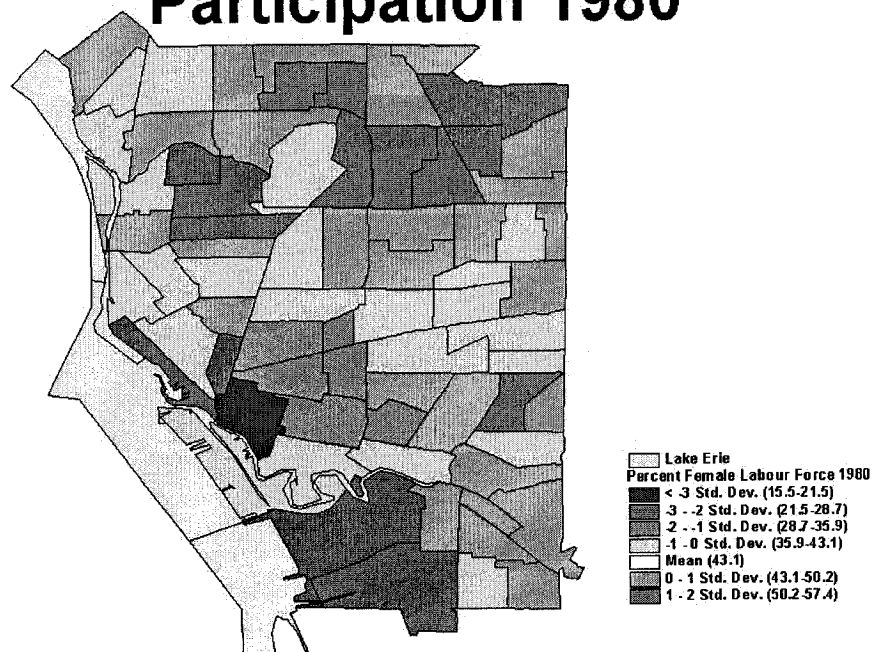
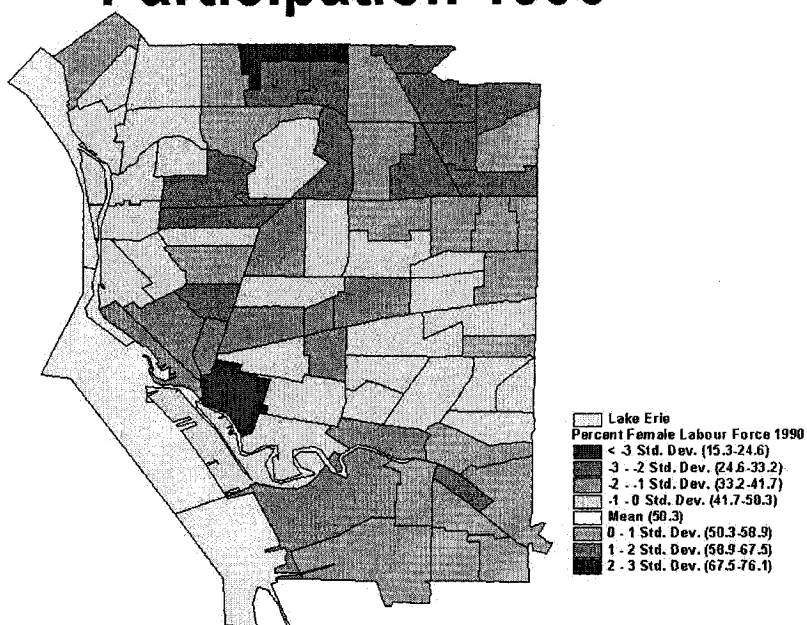


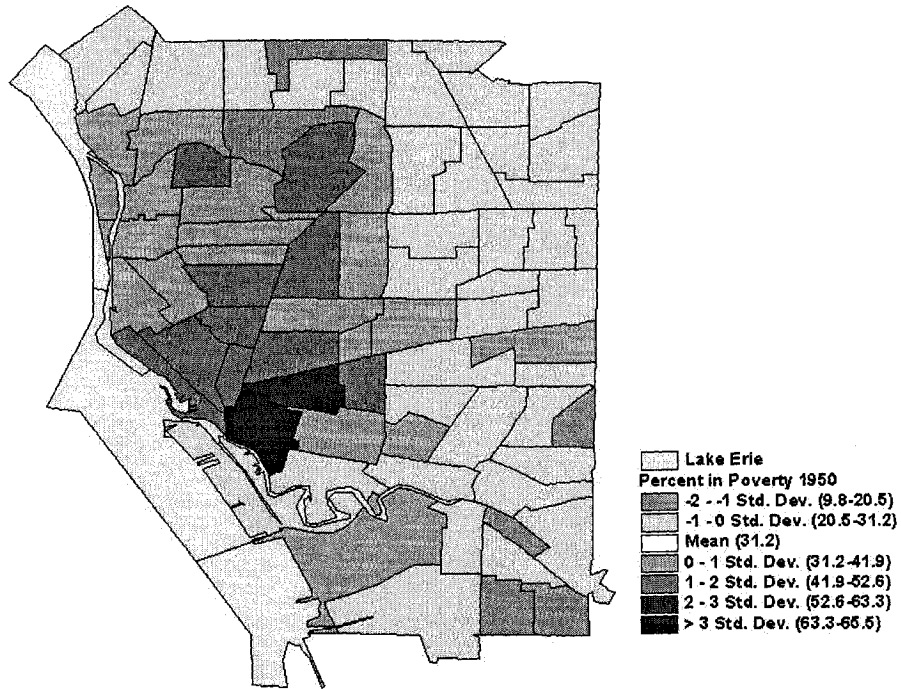
FIGURE 4.23 continued: Percent Females in the Labour Force in Tract in Standard Deviation Units for Buffalo, 1970 and 1980

## Percent Female Labour Force Participation 1990

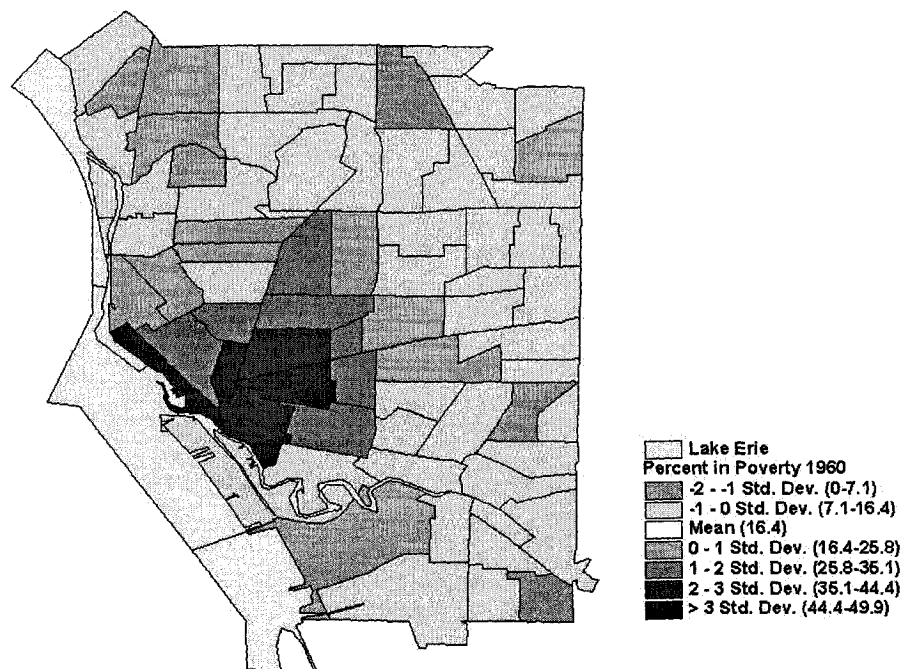


**FIGURE 4.23 continued: Percent Females in the Labour Force in Tract in Standard Deviation Units for Buffalo, 1990**

## Percent in Poverty 1950

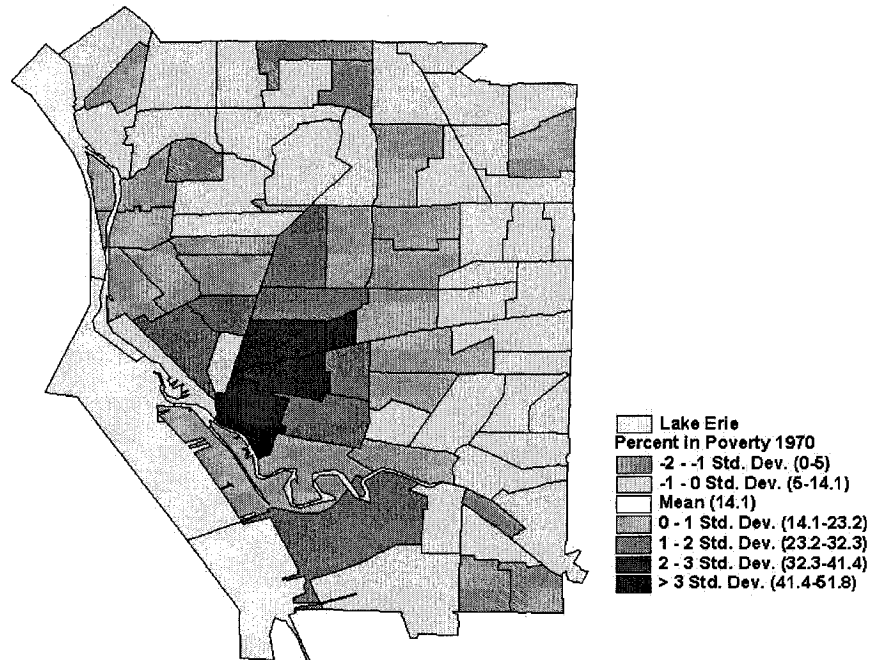


## Percent in Poverty 1960

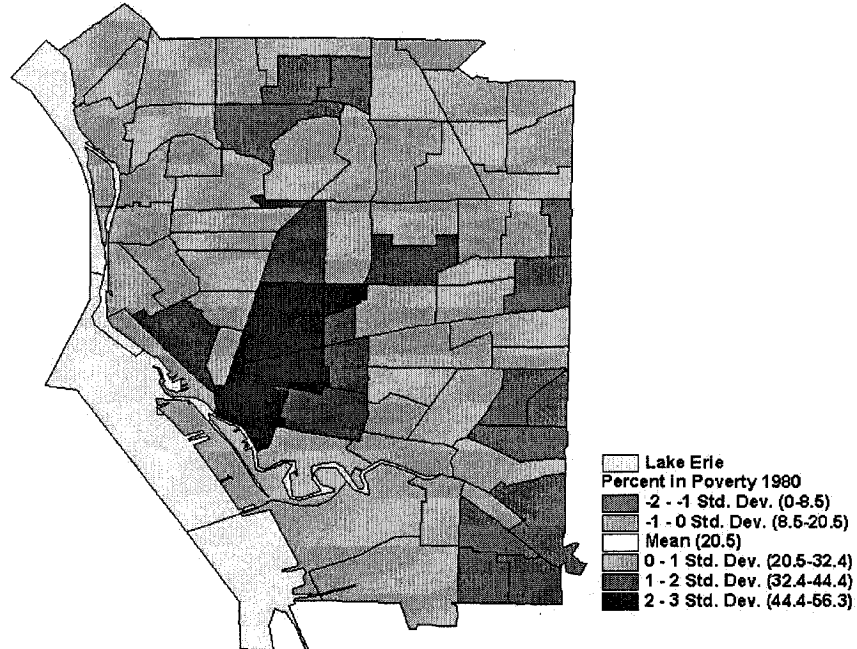


**FIGURE 4.24: Percent in Poverty in Tract in Standard Deviation Units for Buffalo, 1950 and 1960**

## Percent in Poverty 1970

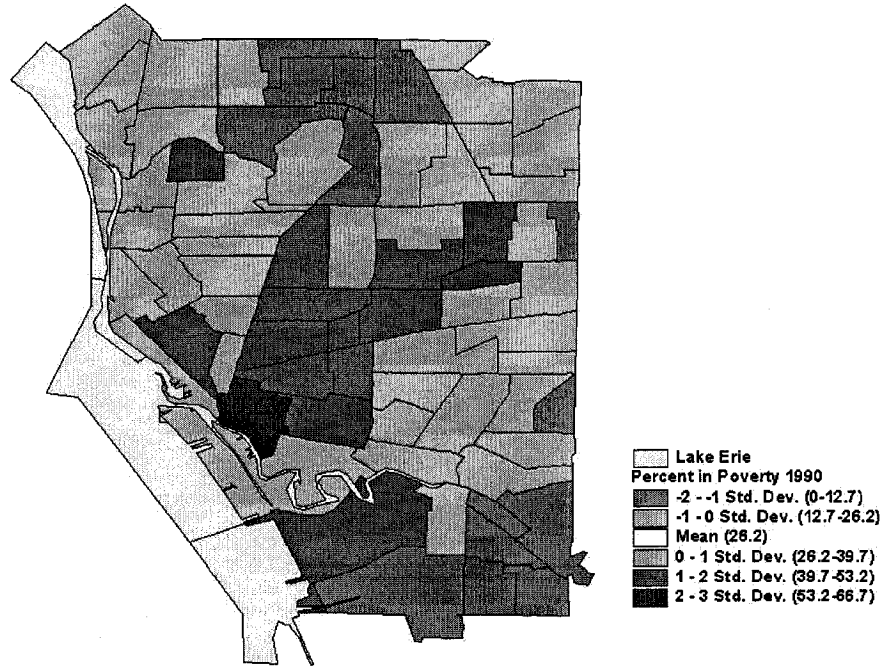


## Percent in Poverty 1980



**FIGURE 4.24 continued: Percent in Poverty in Tract in Standard Deviation Units for Buffalo, 1970 and 1980**

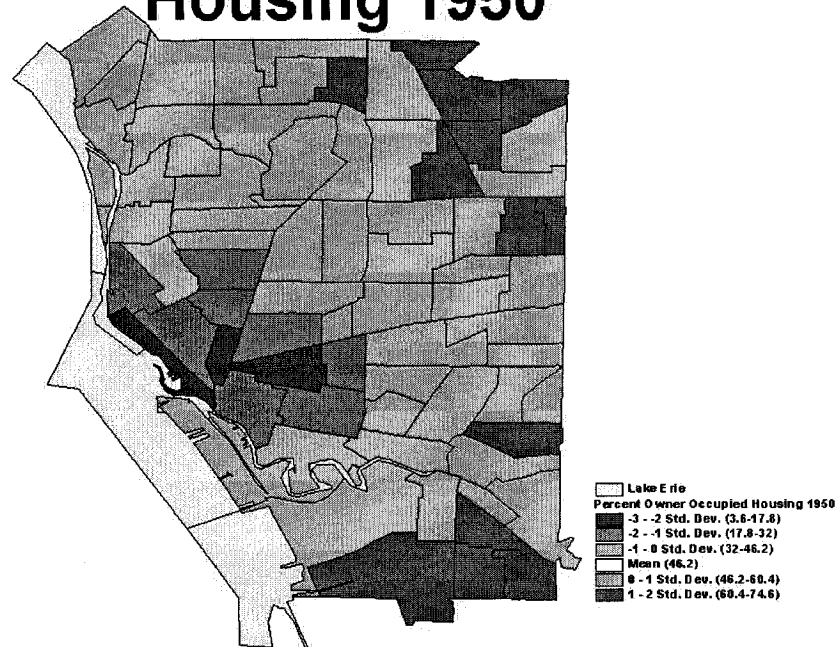
## Percent in Poverty 1990



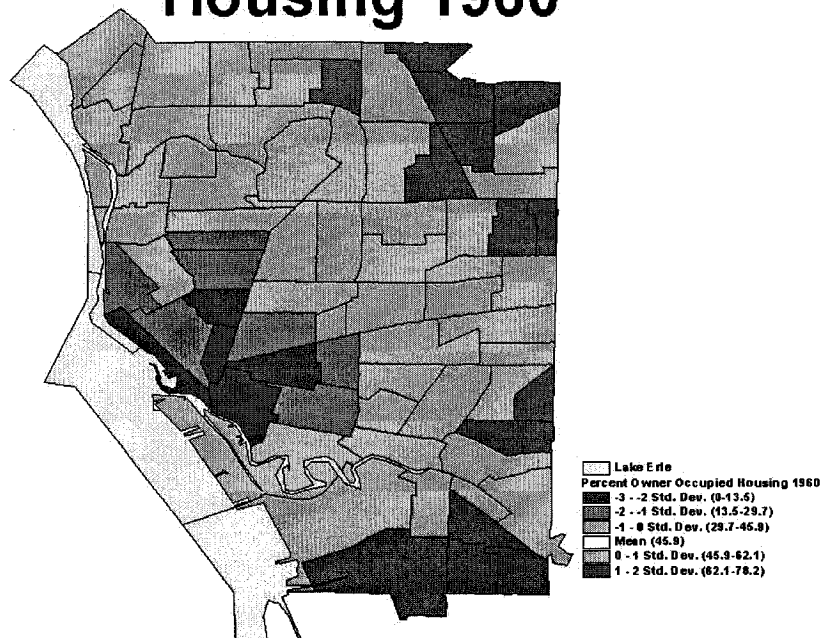
**FIGURE 4.24 continued: Percent in Poverty in Tract in Standard Deviation Units for Buffalo, 1990**



## Percent Owner-Occupied Housing 1950

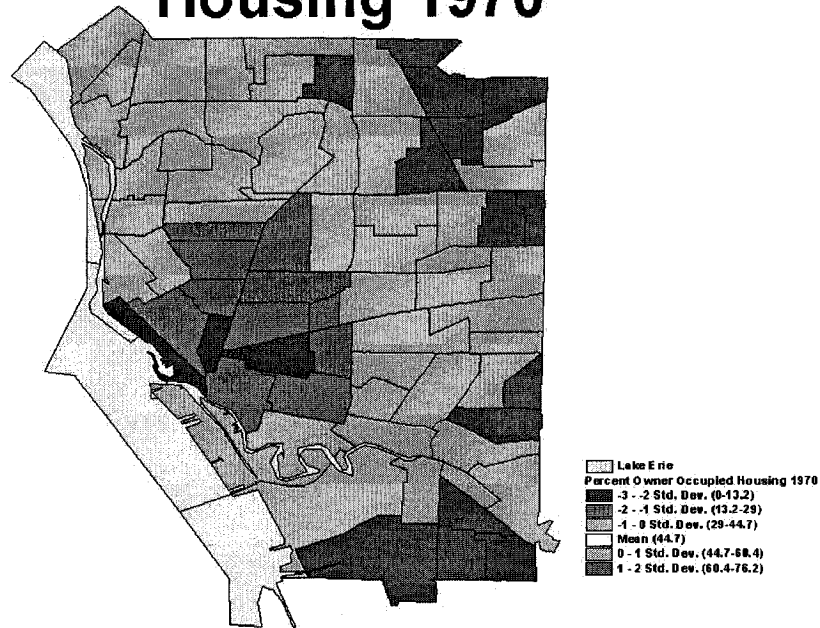


## Percent Owner-Occupied Housing 1960

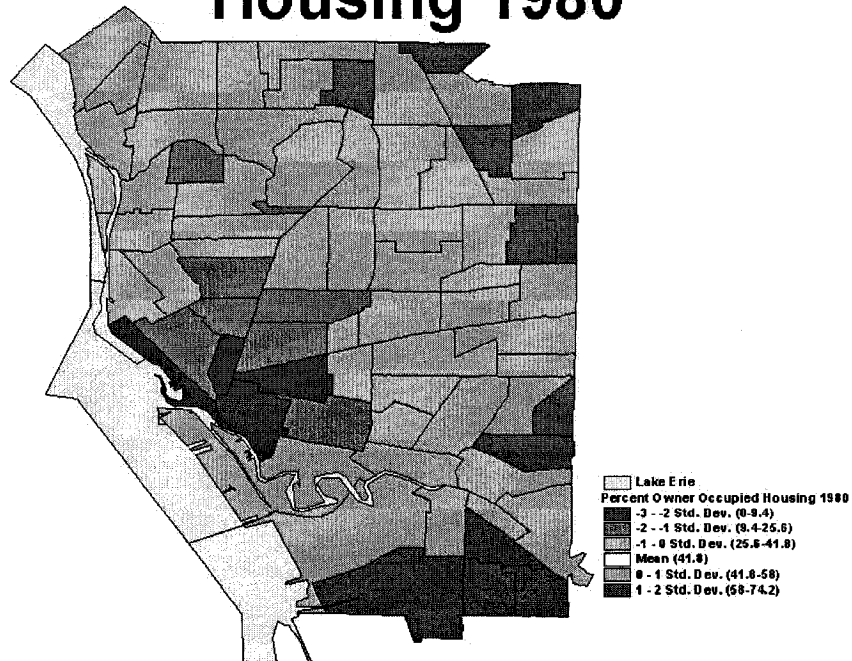


**FIGURE 4.25: Percent Owner-Occupied Housing in Tract in Standard Deviation Units for Buffalo, 1950 and 1960**

## Percent Owner-Occupied Housing 1970

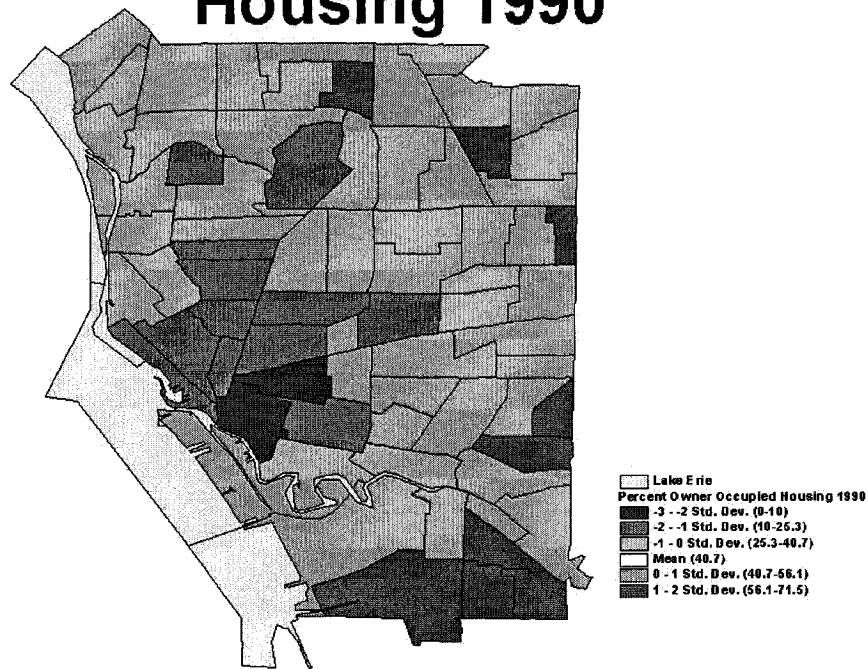


## Percent Owner-Occupied Housing 1980



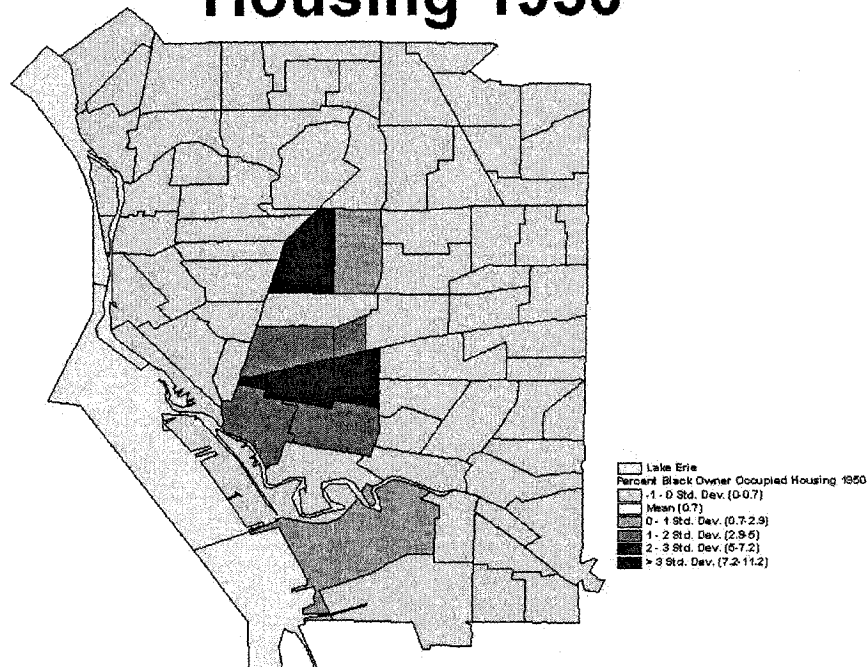
**FIGURE 4.25 continued: Percent Owner-Occupied Housing in Tract in Standard Deviation Units for Buffalo, 1970 and 1980**

## Percent Owner-Occupied Housing 1990

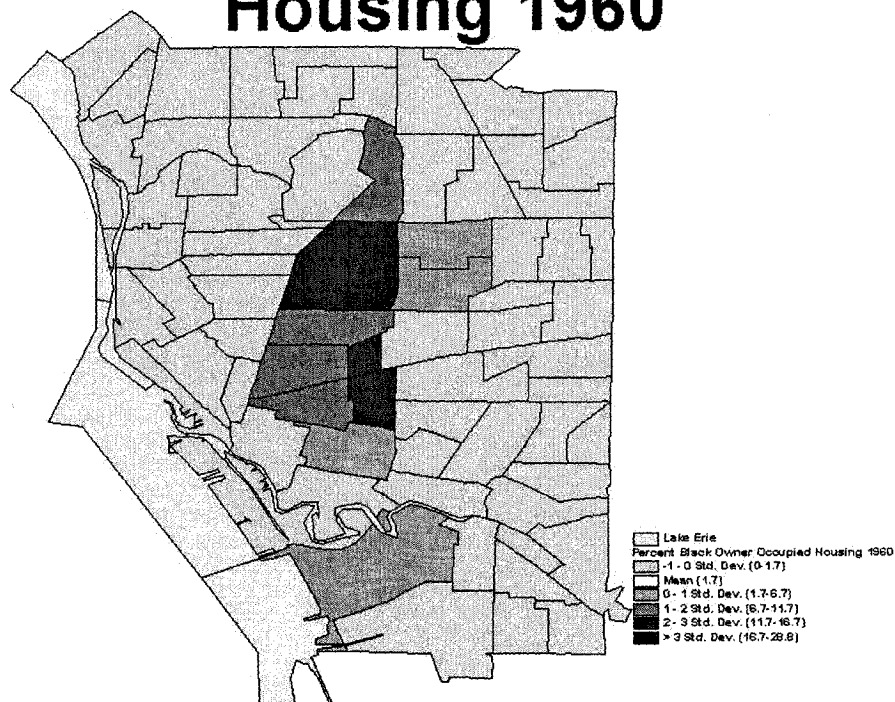


**FIGURE 4.25 continued: Percent Owner-Occupied Housing in Tract in Standard Deviation Units for Buffalo, 1990**

## Percent Black Owner-Occupied Housing 1950

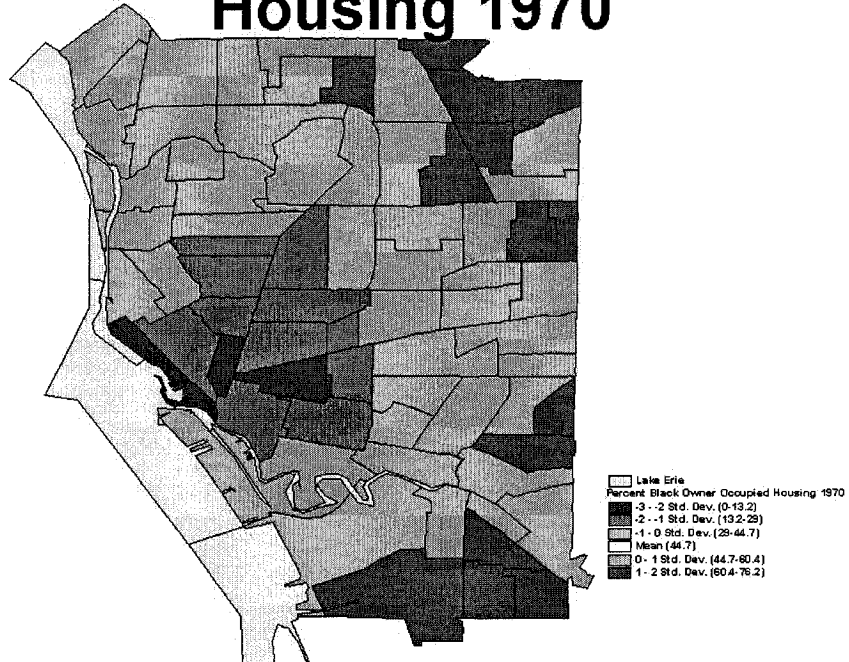


## Percent Black Owner-Occupied Housing 1960

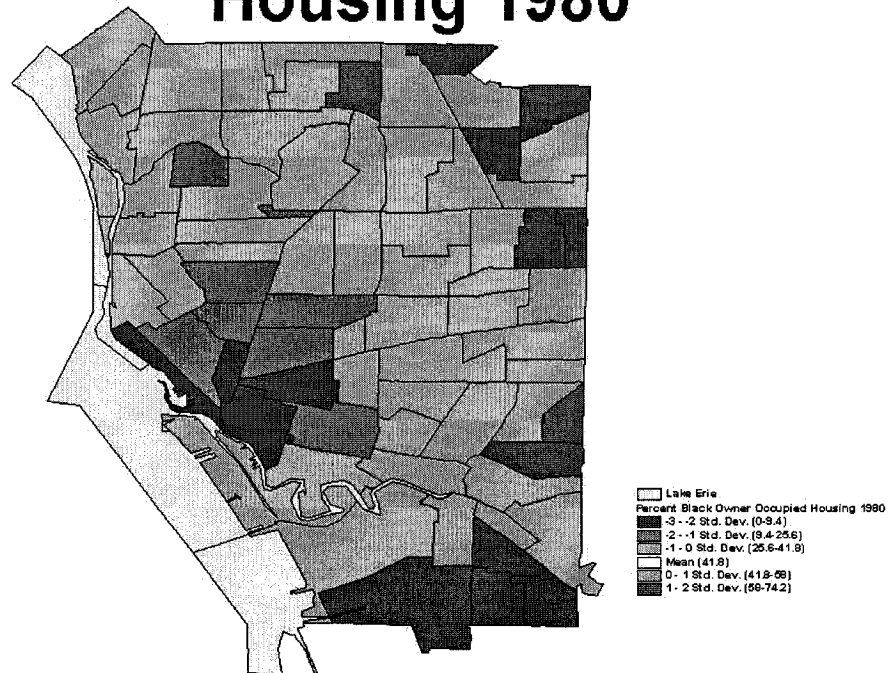


**FIGURE 4.26: Percent Black Owner-Occupied Housing in Tract in Standard Deviation Units for Buffalo, 1950 and 1960**

## Percent Black Owner-Occupied Housing 1970

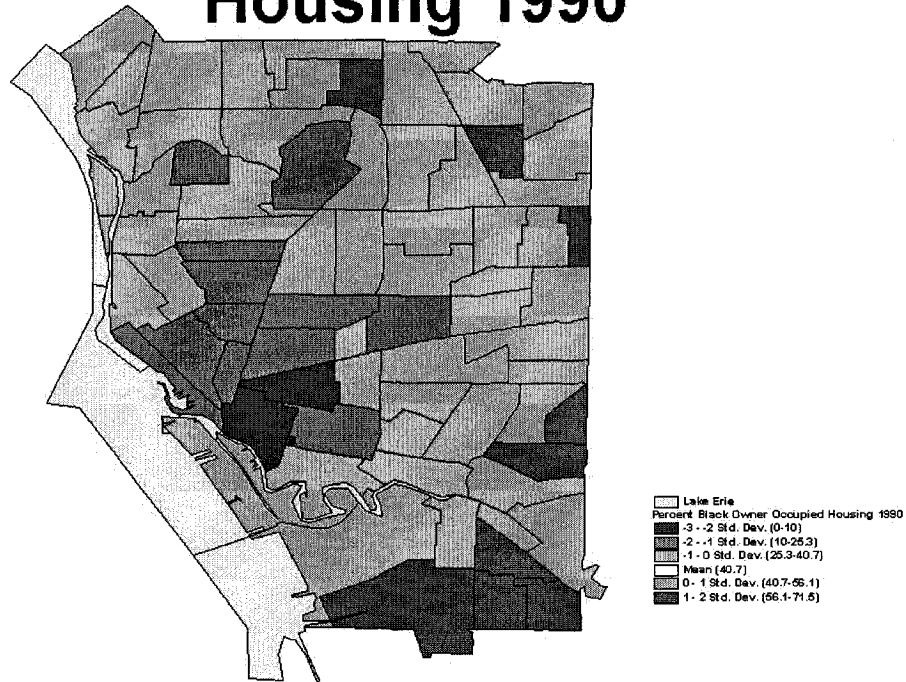


## Percent Black Owner-Occupied Housing 1980



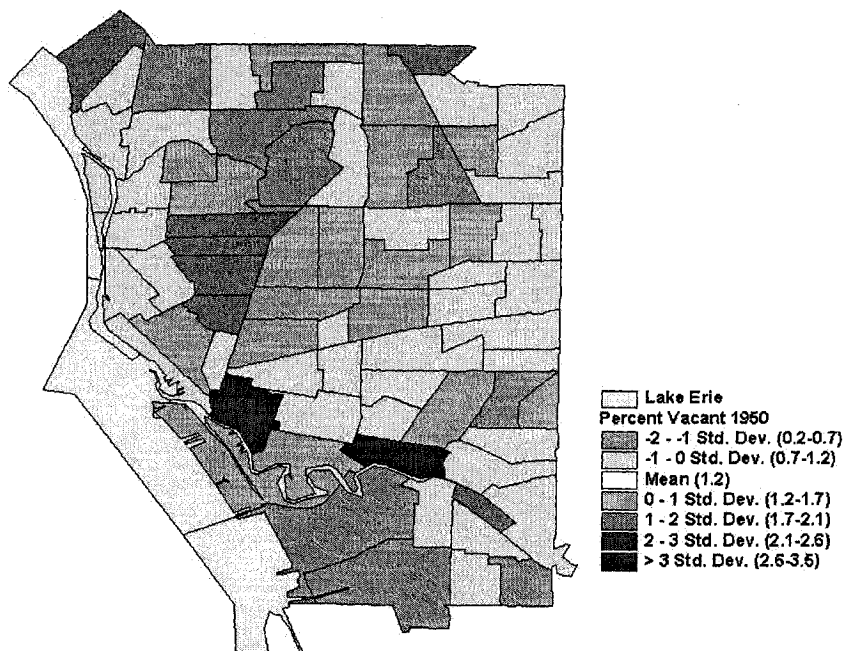
**FIGURE 4.26 continued: Percent Black Owner-Occupied Housing in Tract in Standard Deviation Units for Buffalo, 1970 and 1980**

## Percent Black Owner-Occupied Housing 1990

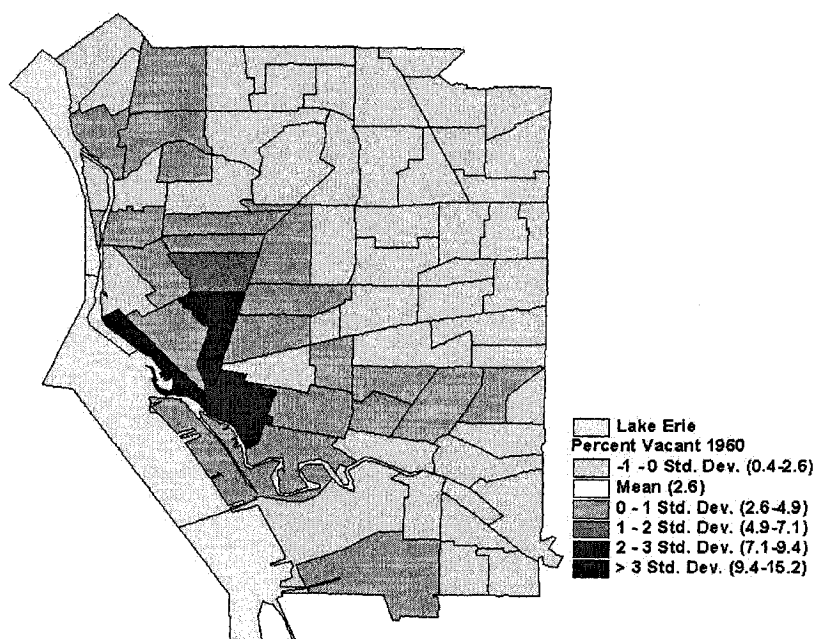


**FIGURE 4.26 continued: Percent Black Owner-Occupied Housing in Tract in Standard Deviation Units for Buffalo, 1990**

## Percent Vacant 1950

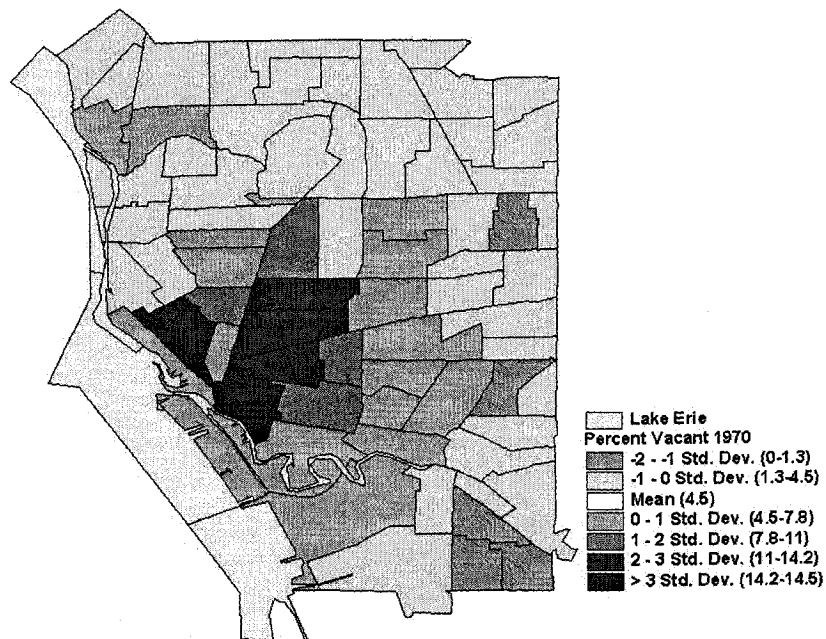


## Percent Vacant 1960

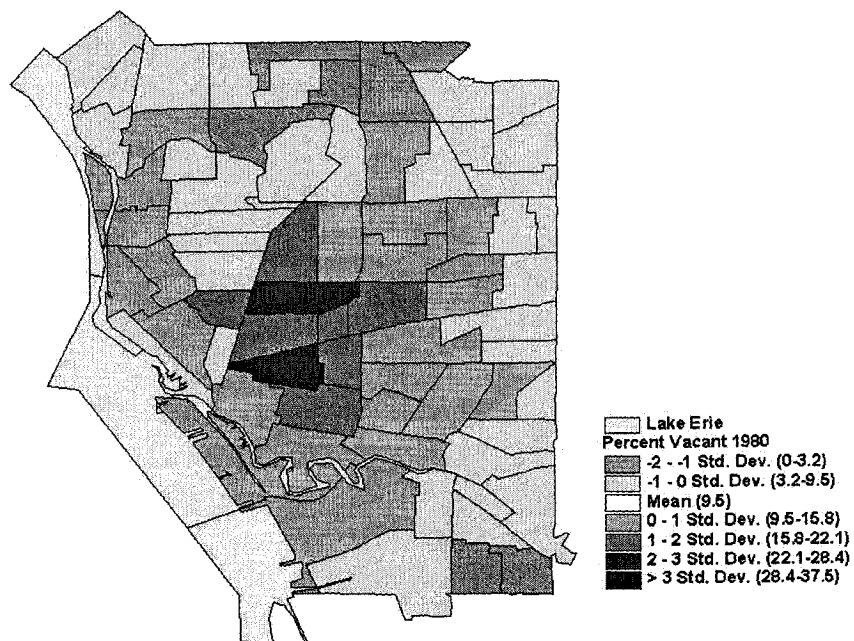


**FIGURE 4.27: Percent Vacant Housing in Tract in Standard Deviation Units for Buffalo, 1950 and 1960**

## Percent Vacant 1970



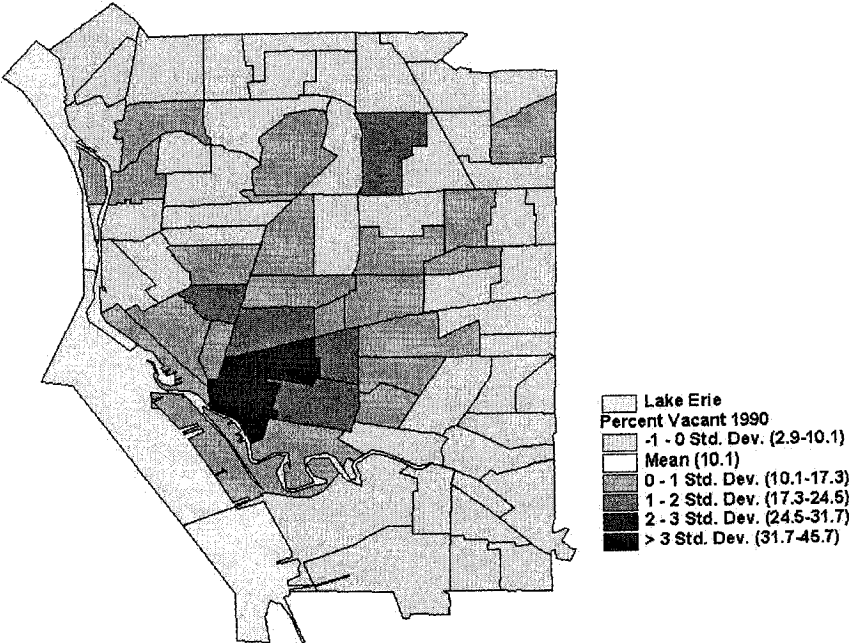
## Percent Vacant 1980



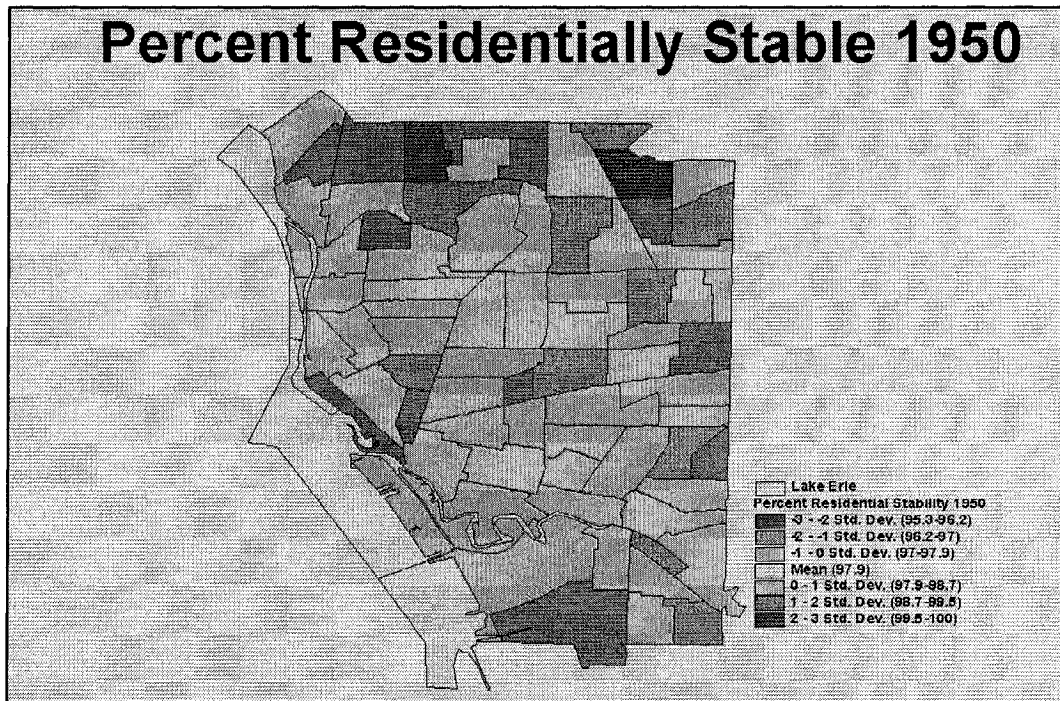
**FIGURE 4.27 continued: Percent Vacant Housing in Tract in Standard Deviation Units for Buffalo, 1970 and 1980**



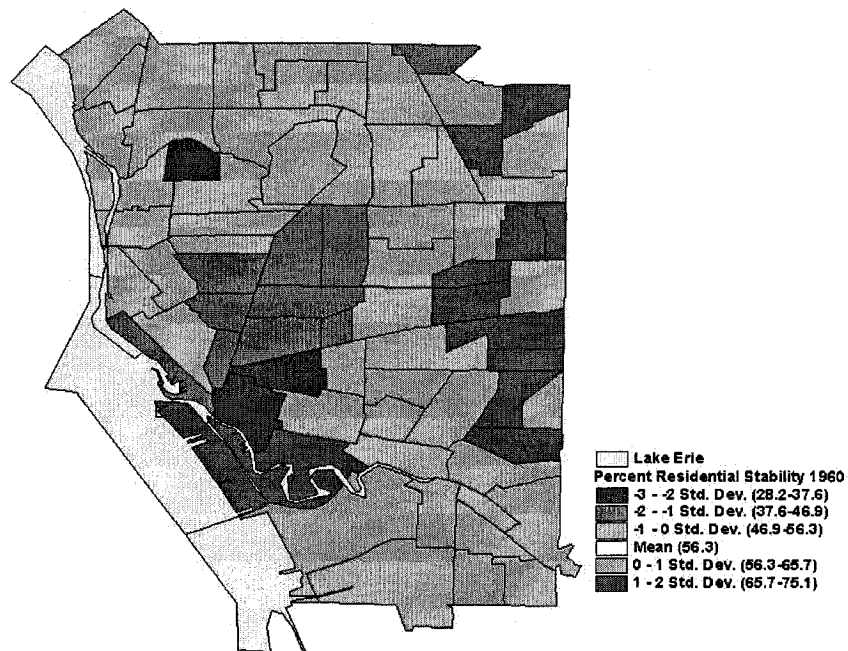
# Percent Vacant 1990



**FIGURE 4.27 continued: Percent Vacant Housing in Tract in Standard Deviation Units for Buffalo, 1990**



### Percent Residentially Stable 1960



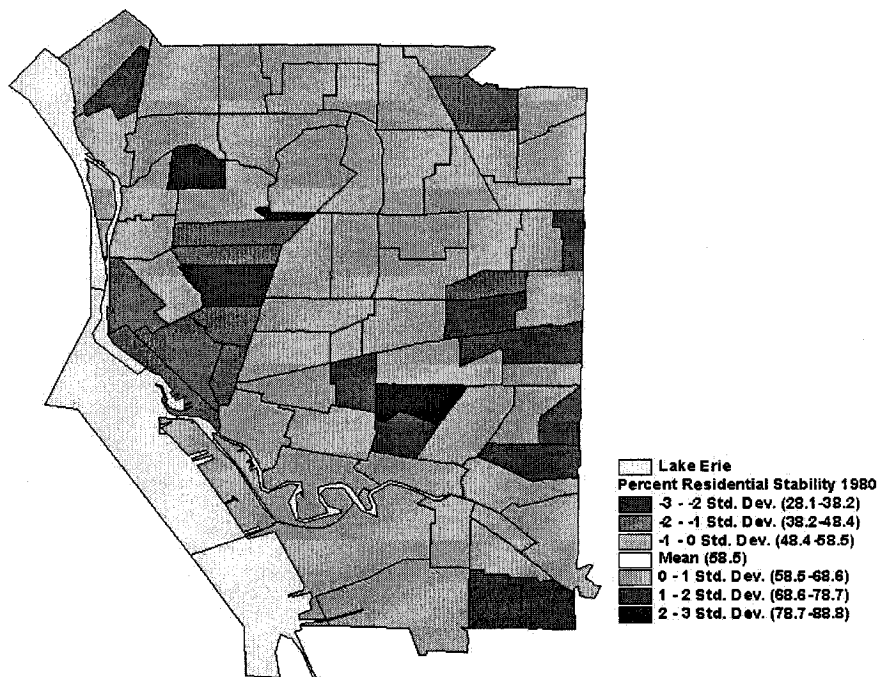
**FIGURE 4.28: Percent Residentially Stable in Tract in Standard Deviation Units for Buffalo, 1950\* and 1960**

\*The variable measuring residential stability at the 1950 census was not consistent with later years. This map does *not* illustrate the percentage of persons living in the same house five years prior.

## Percent Residentially Stable 1970



## Percent Residentially Stable 1980



**FIGURE 4.28 continued: Percent Residentially Stable in Tract in Standard Deviation Units for Buffalo, 1970 and 1980**

## Percent Residentially Stable 1990



**FIGURE 4.28 continued: Percent Residentially Stable in Tract in Standard Deviation Units for Buffalo, 1990**

**APPENDIX 6.I**  
**Models Regressing the 1990s Neighbourhood Homicide Rate on the**  
**Spatial Lag of Homicide with**  
**Each of the Independent Variables in Isolation**

	<b>% Black</b>	<b>% Native Born</b>	<b>% Young</b>	<b>% in Poverty</b>	<b>% not Completing High School</b>
<b>Spatial Lag</b>	0.153 (0.243)	0.801* (0.409)	1.081** (0.365)	0.300 (0.179)	-0.0003 (0.428)
<b>Exogenous Variable*</b>	0.037*** (0.008)	0.115 (0.080)	0.046 (0.033)	0.084*** (0.014)	0.074*** (0.022)
<b>Constant</b>	0.403 (0.296)	-10.702 (7.129)	-1.304 (0.602)	-1.009 (0.296)	-0.869 (0.621)

\* Exogenous variable identified in each column  
Coefficient, (Standard Error)

	<b>% Males not in the LF</b>	<b>% Females not in the LF</b>	<b>% Non-Owner-Occupied</b>	<b>% Black Owner-Occupied</b>	<b>% Vacant</b>	<b>% Res. Mobile</b>
<b>Spatial Lag</b>	0.833*** (0.209)	0.014 (0.530)	0.431 (0.390)	0.432 (0.466)	0.707** (0.251)	0.535 (0.530)
<b>Exogenous Variable*</b>	0.047* (0.019)	0.087** (0.032)	0.040* (0.020)	0.059 (0.031)	0.058 (0.030)	0.015 (0.019)
<b>Constant</b>	-1.427 (0.522)	-2.614 (1.192)	-1.383 (0.710)	0.492 (0.639)	-0.122 (0.350)	0.129 (0.956)

\* Exogenous variable identified in each column  
Coefficient, (Standard Error)

**APPENDIX 6.II**  
**Multinomial Logit Regression Excluding Factor Indices, Buffalo 1960s**

1960s	TWO-STAGE LEAST SQUARES REGRESSION	MULTINOMIAL LOGISTIC REGRESSION*	
		HIGH/HIGH CLUSTER MEMBERSHIP	LOW/LOW CLUSTER MEMBERSHIP
<b>FACTOR 1</b> % IN POVERTY % NON OWNER-OCCUPIED HOUSING % MALES NOT IN LF % VACANT % RES. MOBILE	<b>0.276***</b> (0.089)	X	X
<b>FACTOR 2</b> % BLACK % NATIVE BORN % BLACK OWNER- OCCUPIED HOUSING	<b>0.305***</b> (0.063)	X	X
% YOUNG	0.015 (0.010)	0.062 (0.080) [1.064]	-0.031 (0.069) [0.970]
% FEMALES NOT IN LF	-0.004 (0.010)	0.137 (0.073) [1.147]	0.049 (0.071) [1.051]
% NO HIGH SCHOOL	0.001 (0.005)	0.118 (0.065) [1.126]	0.006 (0.031) [1.006]
SPATIAL LAG OF NEIGHBOURING HOMICIDE RATES	<b>0.555**</b> (0.185)	-	-
CONSTANT/INTERCEPT	-0.134 (0.604)	-22.391 (7.292)	-4.241 (4.289)
<i>R</i> <sup>2</sup>	0.7430	-	-
ADJ. <i>R</i> <sup>2</sup>	-	-	-
NAGELKERKE PSEUDO <i>R</i> <sup>2</sup>	-	0.252	
-2 LOG LIKELIHOOD	-	99.799	
CHI-SQUARE	-	16.190	
<i>N</i>	72	10	11

\*Reference Group for Multinomial Logistic Regression is "Other" (NS, HL, LH) (N=51)

X - Variables omitted from the analysis as inclusion created quasi-complete separation of the data  
Coefficient, (Standard Error), [Odds Ratio]

## REFERENCES

- Abt Associates Inc. (January 14, 2003). "Exploring the Impacts of the HOPE VI Program on Surrounding Neighborhoods." Office of Public Housing Investments, U.S. Department of Housing and Urban Development, Washington D.C.
- Adams, Arvil V. (1981). "The American Work Force in the Eighties: New Problems and Policy Interests Require Improved Labor Force Data." *Annals of the American Academy of Political and Social Science* 453: 123-129.
- Adler, Jeffrey S. and Thomas W. Gallant (2000). "What Do Historians Have to Say about Violence?" *The Henry Frank Guggenheim Review* 4: 45-51.
- Agnew, Robert (1999). "A General Strain Theory of Community Differences in Crime Rates." *The Journal of Research in Crime and Delinquency* 36 (2): 123-155.
- Ahlbrandt, Roger S., Jr. (1984). *Neighborhoods, People, and Community*. New York: Plenum Press.
- Ahlbrandt, Roger and Paul Brophy (1975). *Neighborhood Revitalization: Theory and Practice*. Lexington MA: Lexington Books.
- Allison, Paul D. (1999). *Multiple Regression: A Primer*. Thousand Oaks: Pine Forge Press.
- Almgren, Gunnar, Avery Guest, George Immerwahr, and Michael Spittel (1998). "Joblessness, Family Disruption, and Violent Death in Chicago, 1970-90." *Social Forces* 76 (4): 1465-1493.
- Anderson, Elijah (1999). *The Code of the Street: Decency, Violence, and the Moral Life of the Inner City*. New York: W.W. Norton & Company.
- Andrews, Howard F. (1985). "The Ecology of Risk and the Geography of Intervention: From Research to Practice for the Health and Well-being of Urban Children." *Annals of the Association of American Geographers* 75 (3): 370-382.
- Anselin, Luc (1988). *Spatial Econometrics: Methods and Models*. Boston: Kluwer Academic Publishers.
- Anselin, Luc, Jacqueline Cohen, David Cook, Wilpen Gorr, and George Tita (2000). *Spatial Analyses of Crime*. In Criminal Justice 2000, Vol 14, Measurement and Analysis of Crime and Justice. Washington DC: National Institute of Justice, US Department of Justice.
- Archer, Dane and Rosemary Gartner (1984). *Violence and Crime in Cross-National Perspective*. New Haven: Yale University Press.

Baller, Robert D., Luc Anselin, and Steven F. Messner (2001). "Structural Covariates of U.S. County Homicide Rates: Incorporating Spatial Effects." *Criminology* 39 (3): 561-590.

Baller, Robert D., Dong-Joon Shin, and Kelly K. Richardson (2005). "An Extension and Test of Sutherland's Concept of Differential Social Organization: The Geographic Clustering of Japanese Suicide and Homicide Rates." *Suicide and Life-Threatening Behavior* 35 (3): 343-355.

Batchelor, Andrew (2004). "Executive Summary: Immigration to the United States: 2004 Update." Population Resource Center, accessed on March 10<sup>th</sup> 2005 at <http://www.prcdc.org/summaries/immigrationupdate02/immigrationupdate02.html>

Bellair, Paul E. (1997). "Social Interaction and Community Crime: Examining the Importance of Neighbor Networks." *Criminology* 35 (4): 677-703.

Blau, Judith R. and Peter M. Blau (1982). "The Cost of Inequality: Metropolitan Structure and Violent Crime." *American Sociological Review* 47 (1): 114-129.

Blumstein, Alfred (1995). "Violence by Young People: Why the Deadly Nexus?" *National Institute of Justice Journal* 229: 2-9.

Blumstein, Alfred (2000). "Disaggregating the Violence Trends." In Blumstein and Wallman (Eds.), *The Crime Drop in America*. Cambridge: Cambridge University Press, pp. 13-44.

Blumstein, Alfred and Joel Wallman (Eds.) (2000). *The Crime Drop in America*. Cambridge: Cambridge University Press.

Boggs, Sarah L. (1965). "Urban Crime Patterns." *American Sociological Review* 30 (6): 899-908.

Bogue, Donald. CENSUS TRACT DATA, 1950: ELIZABETH MULLEN BOGUE FILE [Computer file]. ICPSR version. University of Chicago, Community and Family Study Center [producer], 1975. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2000.

Bogue, Donald. CENSUS TRACT DATA, 1960: ELIZABETH MULLEN BOGUE FILE [Computer file]. ICPSR version. University of Chicago, Community and Family Study Center [producer], 1975. Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor], 2000.

Bourgois, Phillipe (2003). *In Search of Respect: Selling Crack in El Barrio*, Second Edition. Cambridge: Cambridge University Press.



- Brady, David and Michael Wallace (2001). "Deindustrialization and Poverty: Manufacturing Decline and AFDC Reciprocity in Lake County, Indiana 1964-93." *Sociological Forum* 16 (2): 321-358.
- Brantingham, Paul J. and Patricia L. Brantingham (Eds.) (1981). *Environmental Criminology*. Beverly Hills: Sage Publications.
- Brooks-Gunn, Jeanne, Greg J. Duncan, and J. Lawrence Aber (Eds.) (1997a). *Neighborhood Poverty: Vol I: Context and Consequences for Children*. New York: Russell Sage Foundation.
- Brooks-Gunn, Jeanne, Greg J. Duncan, J. Lawrence Aber (Eds.) (1997b). *Neighborhood Poverty: Vol II: Policy Implications in Studying Neighborhoods*. New York: Russell Sage Foundation.
- Buffalo Fiscal Stability Authority Act. *Chapter 122 Laws of 2003*, S 5695. 2003-2004 Regular Session. State of New York.
- Burawoy, Michael (1998). "The Extended Case Method." *Sociological Theory* 16 (1): 4-33.
- Bursik, Robert J., Jr. (1984). "Urban Dynamics and Ecological Studies of Delinquency." *Social Forces* 63 (2): 393-413.
- Bursik, Robert J., Jr. (1986a). "Delinquency Rates as Sources of Ecological Change." In Byrne and Sampson (Eds.), *The Social Ecology of Crime*. New York: Springer-Verlag, pp. 63-74.
- Bursik, Robert J., Jr. (1986b). "Ecological Stability and the Dynamics of Delinquency." In Reiss, Jr., and Tonry (Eds.), *Communities and Crime*. Chicago: University of Chicago Press, pp. 35-6.
- Bursik, Robert J., Jr. and Harold G. Grasmick (1993). *Neighborhoods and Crime: The Dimensions of Effective Community Control*. San Francisco: Lexington Books.
- Byrne, James M. (1986). "Cities, Citizens, and Crime." In Byrne and Sampson (Eds.), *The Social Ecology of Crime*. New York: Springer-Verlag, pp. 77-101.
- Byrne, James M. and Robert J. Sampson (1986a). "Key Issues in the Social Ecology of Crime." In Byrne and Sampson (Eds.), *The Social Ecology of Crime*. New York: Springer-Verlag, pp. 1-22.
- Byrne, James M. and Robert J. Sampson (Eds.) (1986b). *The Social Ecology of Crime*. New York: Springer-Verlag.

- Carter, William H., Michael H. Schill, and Susan M. Wachter (1998). "Polarisation, Public Housing, and Racial Minorities in US Cities." *Urban Studies* 35 (10): 1889-1911.
- Chilton, Roland J. (1964). "Delinquency Area Research in Baltimore, Detroit, and Indianapolis." *American Sociological Review* 29 (1): 71-83.
- Cliff, A.D. and J.K. Ord (1973). *Spatial Autocorrelation*. London: Pion.
- Cliff, A. D., P. Haggett, J. K. Ord, and G. R. Versey (1981). *Spatial Diffusion: An Historical Geography of Epidemics in an Island Community*. Cambridge: Cambridge University Press.
- Cohen, Dov (1998). "Culture, Social Organization, and Patterns of Violence." *Journal of Personality and Social Psychology* 75 (2): 408-419.
- Cohen, Jacqueline and George Tita (1999). "Diffusion of Homicide: Exploring a General Method for Detecting Spatial Diffusion Processes." *Journal of Quantitative Criminology* 15 (4): 451-493.
- Cohen, Lawrence E. and Marcus Felson (1979). "Social Change and Crime Rate Trends: A Routine Activity Approach." *American Sociological Review* 44 (4): 588-608.
- Coulton, Claudia J. and Shanta Pandey (1992). "Geographic Concentration of Poverty and Risk to Children in Urban Neighborhoods." *American Behavioral Scientist* 35 (3): 238-257.
- CPS Basic Monthly Survey (July 6 2005). Accessed at: [www.bls.census.gov/cps/intmanb2.htm](http://www.bls.census.gov/cps/intmanb2.htm)
- Crutchfield, Robert D. (1989). "Labor Stratification and Violent Crime." *Social Forces* 68 (2): 489-512.
- Cullen, Julie Berry and Steven D. Levitt (1999). "Crime, Urban Flight, and the Consequences for Cities." *The Review of Economics and Statistics* 81 (2): 159-169.
- Currie, Elliott (1996). "Missing Pieces: Notes on Crime, Poverty, and Social Policy." *Critical Criminology* 7 (1): 37-52.
- de Vaus, David (2002). *Analyzing Social Science Data: 50 Key Problems in Data Analysis*. London: Sage Publications.
- Department of Education, National Center for Educational Statistics, *Digest of Educational Statistics, 2004*.

- Dobrin, Adam, Daniel Lee, and Jamie Price (2005). "Neighborhood Structure Differences between Homicide Victims and Non-Victims." *Journal of Criminal Justice* 33 (2): 137-143.
- Downey, Greg (2003). "Telegraph Messenger Boys: Crossing the Borders between History of Technology and Human Geography." *The Professional Geographer* 55 (2): 134-145.
- Dreier, Peter, John Mollenkopf, and Todd Swanstrom (2001). *Place Matters: Metropolitcs for the Twenty-First Century*. Kansas: The University Press of Kansas.
- Du Bois, W. E. B. (1899). *The Philadelphia Negro*. Philadelphia: University of Pennsylvania Press [1996].
- Dugan, Laura (1999). "The Effect of Criminal Victimization on a Household's Moving Decision." *Criminology* 37 (4): 903-930.
- Durkheim, Emile (1933). *On the Division of Labor in Society*. New York: Macmillan.
- Eisinger, Peter (2003). "Reimagining Detroit." *City & Community* 2 (2): 85-99.
- Federal Immigration Commission, Abstracts of Reports of the (1910). 61<sup>st</sup> Congress, 3<sup>rd</sup> Session, Senate Document 747/1, Volume 1, p. 163.
- Felson, Marcus (1998). *Crime and Everyday Life*, Second Edition. Thousand Oaks: Pine Forge Press.
- Fischer, Claude S. (1980). "The Spread of Violent Crime from City to Countryside, 1955 to 1975." *Rural Sociology* 45 (3): 416-434.
- Fletcher, Joseph (1849). "Moral and Educational Statistics of England and Wales." *Journal of the Statistical Society of London* 12: 151-176 (No. 2); 189-335 (No. 3).
- Friedland, Roger (1982). *Power and Crisis in the City*. London: Macmillan.
- Furstenberg, Frank F., Jr., and Mary Elizabeth Hughes (1997). "The Influence of Neighborhoods on Children's Development: A Theoretical Perspective and a Research Agenda." In Brooks-Gunn, Duncan, and Aber (Eds.), *Neighborhood Poverty: Vol II: Policy Implications in Studying Neighborhoods*. New York: Russell Sage Foundation, pp. 23-47.
- Galea, Sandro and Jennifer Ahern (2005). "Distribution of Education and Population Health: An Ecological Analysis of New York City Neighborhoods." *American Journal of Public Health* 95 (12): 2198-2205.

Gans, Herbert J. (1962). *The Urban Villagers: Group and Class in the Life of Italian-Americans*. New York: The Free Press [1982].

Garson, G. David (accessed April 2005). *Statistics: An Online Textbook*. Accessed at <http://www2.chass.ncsu.edu/garson/pa765/statnote.htm>

Gartner, Rosemary (1990). "The Victims of Homicide: A Temporal and Cross-National Comparison." *American Sociological Review* 55 (1): 92-106.

Gartner, Rosemary and Bill McCarthy (n.d.). Homicide in Four Cities Data Set. Social Sciences and Humanities Research Council of Canada Grant # 410-94-0756.

Gephart, Martha A. and Jeanne Brooks-Gunn (1997). "Introduction." In Brooks-Gunn, Duncan, and Aber (Eds.), *Neighborhood Poverty: Vol I: Context and Consequences for Children*. New York: Russell Sage Foundation, pp. xiii-xxii.

Gerhart, Barry A. and Paul Jarley (1987). "Comment on Louis Jacobson's 'A Tale of Employment Decline in Two Cities: How Bad Was the Worst of Times?'" *Industrial and Labor Relations Review* 40 (2): 280-284.

GeoLytics, Inc. (2003). "Neighbourhood Change Data Base (NCDB)." East Brunswick, New Jersey.

Gibson, Campbell (1998). "Population of the 100 Largest Cities and Other Urban Places in the United States: 1790 to 1990." U.S. Bureau of the Census, Population Division, Population Division Working Paper No. 27, Washington, D.C.

Glaeser, Edward L. and Bruce Sacerdote (1999). "Why is there more Crime in Cities?" *Journal of Political Economy* 107 (6): 225-258.

Glueck, Sheldon and Eleanor T. Glueck (1930). *500 Criminal Careers*. New York: Alfred A. Knopf.

Goldman, Mark (1983). *High Hopes: The Rise and Decline of Buffalo New York*. Albany: SUNY Press.

Goldman, Mark (1990). *City on the Lake: The Challenge of Change in Buffalo, New York*. New York: Prometheus Books.

Gottfredson, Michael R. and Travis Hirschi (1990). *A General Theory of Crime*. Stanford: Stanford University Press.

Grannis, Rick (1998). "The Importance of Trivial Streets: Residential Streets and Residential Segregation." *American Journal of Sociology* 103 (6): 1530-1564.

- Grannis, Rick (2002). "From Neighbors to Neighborhood Effects: Social Networks and Street Networks." Unpublished Manuscript.
- Griffiths, Elizabeth (2004). "Trading Spaces: The Movement of Homicide Incidents out of the Downtown Core, Buffalo, N.Y. 1950-1999." Presented at the *American Society of Criminology* conference, Nashville, TN.
- Griffiths, Elizabeth & Jorge M. Chavez (2004). "Communities, Street Guns, and Homicide Trajectories in Chicago, 1980-1995: Merging Methods for Examining Homicide Trends across Time and Space." *Criminology* 42 (4): 941-978.
- Griffiths, Elizabeth and George Tita (2003). "Violent People, Violent Places?: Community Characteristics and the Spatial Typology of Homicide." Presentation at the *American Society of Criminology* conference, Denver, CO.
- Groff, Elizabeth and Tom McEwen (2004). Homicide Mobility Triangles: A New Look at an Old Technique. Presented at the *National Institute of Justice* annual conference on Criminal Justice Research and Evaluation, Washington D.C.
- Grossman, Cathy Lynn (February 12, 2001). "Lots and Lots of Heart in Buffalo." *USA Today*.
- Guerry, André-Michel (1833). *Essai sur la Statistique Morale de la France*. New York: Clearwater [1974].
- Gurr, Ted Robert (1989). "Historical Trends in Violent Crime: Europe and the United States." In Gurr (Ed.), *Violence in America: Volume 1: The History of Crime*. Newbury Park: Sage Publications, pp. 21-54.
- Hagan, John and Alberto Palloni (1998). "Immigration and Crime in the United States." In Smith and Edmonston (Eds.), *The Immigration Debate: Studies on the Economic, Demographic, and Fiscal Effects of Immigration*. Washington: National Academy Press, pp. 367-387.
- Hall, Stuart (1978). "The Social History of a 'Moral Panic'." In Hall, Cricher, Jefferson, Clarke, and Roberts (Eds.), *Policing the Crisis: Mugging, the State, and Law and Order*. Houndmills Basingstoke Hampshire: Palgrave Macmillan, pp. 3-28.
- Halpern, Stephen C. (1974). "Police Employee Organizations and Accountability Procedures in Three Cities: Some Reflections on Police Policy-Making." *Law & Society Review* 8 (4): 561-582.
- Hamel, Jacques (1992). "On the Status of Singularity in Sociology." *Current Sociology* 40 (1): 99-119.

Hannon, Lance E. (2005). "Extremely Poor Neighborhoods and Homicide." *Social Science Quarterly* 86 (5): 1418-1434.

Harring, Sidney L. (1985). "Urban History as a Metaphor: Buffalo History, Old and New." *Qualitative Sociology* 8 (1): 79-83.

Harrison, Bennett and Barry Bluestone (1990). *The Great U-Turn: Corporate Restructuring and the Polarizing of America*, Reprint Edition. New York: Basic Books.

Hawkins, Darnell F. (1999). "African Americans and Homicide." In Smith and Zahn (Eds.), *Studying and Preventing Homicide: Issues and Challenges*. Thousand Oaks: Sage Publications, pp. 143-158.

Heide, Kathleen M. (1999). "Youth Homicide." In Smith and Zahn (Eds.), *Studying and Preventing Homicide: Issues and Challenges*. Thousand Oaks: Sage Publications, pp.175-196.

Heitgerd, Janet L. and Robert J. Bursik, Jr. (1987). "Extracommunity Dynamics and the Ecology of Delinquency." *American Journal of Sociology* 92 (4): 775-787.

Hirsch, Arnold R. (1983). *Making the Second Ghetto: Race and Housing in Chicago, 1940-1960*. Chicago: University of Chicago Press [1998].

Hirschi, Travis and Michael R. Gottfredson (1983). "Age and the Explanation of Crime." *American Journal of Sociology* 89 (3): 552-584.

Hoff, Karla and Arijit Sen (2005). "Homeownership, Community Interactions, and Segregation." *The American Economic Review* 95 (4): 1167-1189.

Hunter, Albert J. (1985). "Private, Parochial, and Public School Orders: The Problem of Crime and Incivility in Urban Communities." In Suttles and Zald (Eds.), *The Challenge of Social Control: Citizenship and Institution Building in Modern Society*. Norwood, NJ: Ablex Publishing, pp. 230-242.

Husock, Howard (1991). "Mocking the Middle Class: The Perverse Effects of Housing Subsidies." *Policy Review* 56: 65-69.

Ingoldsby, Erin M. and Daniel S. Shaw (2002). "Neighborhood Contextual Factors and Early-Starting Antisocial Pathways." *Clinical Child and Family Psychology Review* 5 (1): 21-55.

Institute for Local Governance and Regional Growth (2000). *State of the Region: Performance Indicators for the Buffalo-Niagara Region in the 21<sup>st</sup> Century*. Buffalo: University at Buffalo, State University of New York.

Isaac, Larry W. and Larry J. Griffin (1989). "Ahistoricism in Time-Series Analyses of Historical Process: Critique, Redirection, and Illustrations from U.S. Labor History." *American Sociological Review* 54 (6): 873-890.

Jacobs, Jane (1961). *The Death and Life of Great American Cities*. New York: Vintage Books.

Jacobson, Louis (1984). "A Tale of Employment Decline in Two Cities: How Bad Was the Worst of Times?" *Industrial and Labor Relations Review* 37 (4): 557-569.

Jargowsky, Paul A. (1997). *Poverty and Place: Ghettos, Barrios, and the American City*. New York: Russell Sage Foundation.

Jargowsky, Paul A. & Mary Jo Bane (1991). "Ghetto Poverty in the United States: 1970 to 1980." In Jencks and Peterson (Eds.), *The Urban Underclass*. Washington: The Brookings Institute, pp. 235-273.

Jencks, Christopher and Paul E. Peterson (Eds.) (1991). *The Urban Underclass*. Washington D.C.: The Brookings Institute.

Johnson, Daniel and Rex Campbell (1981). *Black Migration in America: A Social Demographic History*. North Carolina: Duke University Press.

Kain, John F. (1968). "Housing Segregation, Negro Employment, and Metropolitan Decentralization." *Quarterly Journal of Economics* 82 (2): 175-97.

Kain, John F. (1994). "The Spatial Mismatch Hypothesis: Three Decades Later." *Housing Policy Debate* 3 (2): 371-462.

Kasarada, John (1989). "Urban Industrial Transition and the Urban Underclass." *Annals of the American Academy of Political and Social Science* 501: 26-47.

Keating, W. Dennis and Janet Smith (1996). "Neighborhoods in Transition." In Keating, Krumholz, and Star (Eds.), *Revitalizing Urban Neighborhoods*. Kansas: University of Kansas Press, pp. 24-38.

Koritz, Douglas (1991). "Restructuring or Destructuring? Deindustrialization in Two Industrial Heartland Cities." *Urban Affairs Quarterly* 26 (4): 497-511.

Kornhauser, Ruth Rosner (1978). *Social Sources of Delinquency: An Appraisal of Analytic Models*. Chicago: University of Chicago Press.

Kraus, Neil (2000). *Race, Neighborhoods, and Community Power: Buffalo Politics, 1934-1997*. New York: State University of New York Press.

Krivo, Lauren J. and Ruth D. Peterson (1996). "Extremely Disadvantaged Neighborhoods and Urban Crime." *Social Forces* 75 (2): 619-648.

Krivo, Lauren J. and Ruth D. Peterson (2000). "The Structural Context of Homicide: Accounting for Racial Differences in Process." *American Sociological Review* 65 (4): 547-559.

Krivo, Lauren J., Ruth D. Peterson, Helen Rizzo, and John R. Reynolds (1998). "Race, Segregation, and the Concentration of Disadvantage: 1980-1990." *Social Problems* 45 (1): 61-80.

Kubrin, Charis E. and Jerald R. Herting (2003). "Neighborhood Correlates of Homicide Trends: An Analysis Using Growth Curve Modeling." *The Sociological Quarterly* 44 (3): 329-350.

Kubrin, Charis E. and Ronald Weitzer (2003a). "New Directions in Social Disorganization Theory." *Journal of Research in Crime and Delinquency* 40 (4): 374-402.

Kubrin, Charis E. and Ronald Weitzer (2003b). "Retaliatory Homicide: Concentrated Disadvantage and Neighborhood Culture." *Social Problems* 50 (2): 157-180.

LaFree, Gary (1999). "Declining Violent Crime Rates in the 1990s: Predicting Crime Booms and Busts." *Annual Review of Sociology* 25: 145-168.

Land, Kenneth C., Patricia L. McCall, and Lawrence E. Cohen (1990). "Structural Covariates of Homicide Rates: Are There Any Invariances across Time and Social Space?" *American Journal of Sociology* 95 (4): 922-963.

Lane, Roger (1989). "On the Social Meaning of Homicide Trends in America." In Gurr (Ed.), *Violence in America: Volume 1: The History of Crime*. Newbury Park: Sage Publications, pp. 55-79.

Lane, Roger (1997). *Murder in America: A History*. Columbus: Ohio State University Press.

Laska, Shirley Bradway, Jerrol M. Seaman, and Dennis R. McSeveney (1982). "Inner-City Reinvestment: Neighborhood Characteristics and Spatial Patterns over Time." *Urban Studies* 29 (2): 155-165.

Lee, Matthew R. (2000). "Concentrated Poverty, Race, and Homicide." *The Sociological Quarterly* 41 (2): 189-206.

Lee, Matthew T. (2003). *Crime on the Border: Immigration and Homicide in Urban Communities*. New York: LFB Scholarly Publishing.



Lee, Matthew T., Ramiro Martinez, Jr., and S. Fernando Rodriguez (2000). "Contrasting Latinos in Homicide Research: The Victim and Offender Relationship in El Paso and Miami." *Social Science Quarterly* 81 (1): 375-388.

Lee, Matthew T., Ramiro Martinez, Jr., and Richard Rosenfeld (2001). "Does Immigration Increase Homicide? Negative Evidence from Three Border Cities." *Sociological Quarterly* 42 (4): 559-580.

Liska, Allen E. and Paul E. Bellair (1995). "Violent-Crime Rates and Racial Composition: Convergence over Time." *American Journal of Sociology* 101 (3): 578-610.

Logan, John R. and Harvey L. Molotch (1987). *Urban Fortunes: The Political Economy of Place*. Berkeley: University of California Press.

Macmillan, Ross and Rosemary Gartner (1999). "When She Brings Home the Bacon: Labor Force Participation and the Risk of Spousal Violence against Women." *Journal of Marriage and the Family* 61 (4): 947-958.

Martinez, Ramiro, Jr. (2002). *Latino Homicide: Immigration, Violence, and Community*. New York: Routledge.

Martinez, Ramiro, Jr., and Matthew T. Lee (1999). "Latinos and Homicide." In Smith and Zahn (Eds.), *Studying and Preventing Homicide: Issues and Challenges*. Thousand Oaks: Sage Publications, pp.159-174.

Massey, Douglas S. and Mitchell L. Eggers (1990). "The Ecology of Inequality: Minorities and the Concentration of Poverty, 1970-1980." *American Journal of Sociology* 95 (5): 1153-1188.

Massey, Douglas S. and Nancy A. Denton (1993). *American Apartheid: Segregation and the Making of the Underclass*. Cambridge: Harvard University Press.

Massey, Douglas S. and Mitchell L. Eggers (1993). "The Spatial Concentration of Affluence and Poverty during the 1970s." *Urban Affairs Quarterly* 29: 299-315.

Maxon, Cheryl L. (1999). "Gang Homicide." In Smith and Zahn (Eds.), *Studying and Preventing Homicide: Issues and Challenges*. Thousand Oaks: Sage Publications, pp.197-220.

Mayer, Susan E. and Christopher Jencks (1989). "Growing Up in Poor Neighborhoods: How Much Does it Matter?" *Science* 243 (4897): 1441-1445.

Mayhew, Henry (1861). *London Labour and the London Poor: A Cyclopaedia of the Condition and Earnings of Those That Will Work, Those That Cannot Work, and Those That Will Not Work*. New York: A.M. Kelley [1967].

- McNulty, Thomas L. (2001). "Assessing the Race-Violence Relationship at the Macro Level: The Assumption of Racial Invariance and the Problem of Restricted Distributions." *Criminology* 39 (2): 467-490.
- Menard, Scott and David Huizinga (2001). "Repeat Victimization in a High Risk Neighborhood Sample of Adolescents." *Youth & Society* 32 (4): 447-472.
- Merton, Robert K. (1938). "Social Structure and Anomie." *American Sociological Review* 3 (5): 672-682.
- Messner, Steven F. and Kenneth Tardiff (1985). "The Social Ecology of Urban Homicide: An Application of the "Routine Activities" Approach." *Criminology* 23 (2): 241-267.
- Messner, Steven F., Luc Anselin, Robert D. Baller, Darnell F. Hawkins, Glenn Deane, and Stewart E. Tolnay (1999). "The Spatial Patterning of County Homicide Rates: An Application of Exploratory Spatial Data Analysis." *Journal of Quantitative Criminology* 15 (4): 423-450.
- Miethe, Terance D., Michael Hughes, and David McDowall (1991). "Social Change and Crime Rates: An Evaluation of Alternative Theoretical Approaches." *Social Forces* 70 (1): 165-185.
- Miethe, Terance D. and Wendy C. Regoeczi (2004). *Rethinking Homicide: Exploring the Structure and Process Underlying Deadly Situations*. Cambridge: Cambridge University Press.
- Miller, Walter B. (1958). "Lower Class Culture as a Generating Milieu of Gang Delinquency." *The Journal of Social Issues* 14 (3): 5-19.
- Monmonier, Mark (1993). *Mapping It Out: Expository Cartography for the Humanities and Social Sciences*. Chicago: University of Chicago Press.
- Morenoff, Jeffrey D. and Robert J. Sampson (1997). "Violent Crime and the Spatial Dynamics of Neighborhood Transition: Chicago, 1970-1990." *Social Forces* 76 (1): 31-64.
- Morenoff, Jeffrey D., Robert J. Sampson, and Stephen W. Raudenbush (2001). "Neighborhood Inequality, Collective Efficacy, and the Spatial Dynamics of Urban Violence." *Criminology* 39 (3): 517-559.
- Murray, Charles (1984). *Losing Ground: American Social Policy, 1950 to 1980*. New York: Basic Books.

Naparstek, Arthur J., Susan R. Freis, and G. Thomas Kingsley (February 2000). "HOPE VI: Community Building Makes a Difference." U.S. Department of Housing and Urban Development, Washington D.C.

National Commission on Law Observance and Enforcement (1936). "Report on Crime and the Foreign Born." No. 10, p. 4.

*New York Times* (February 9 1975). "Down and Out in America: In anger and sadness, people in Buffalo tell the story of unemployment."

Newman, Katherine (1999). *No Shame in my Game: The Working Poor in the Inner City*. New York: Knopf.

Norwood, Janet L. and Judith M. Tanur (1994). "Measuring Unemployment in the Nineties – The Polls: A Review." *Public Opinion Quarterly* 58 (2): 277-294.

Openshaw, S. and P.J. Taylor (1981). "The Modifiable Areal Unit Problem." In Wrigley and Bennett (Eds.) *Quantitative Geography: A British View*. London: Routledge and Kegan Paul, pp. 60-69.

Orshansky, Mollie (1963). "Children of the Poor." *Social Security Bulletin* 26 (7): 3-13.

Orshansky, Mollie (1965). "Counting the Poor: Another Look at the Poverty Profile." *Social Security Bulletin* 28 (1): 3-29.

Ousey, Graham C. (1999). "Homicide, Structural Factors, and the Racial Invariance Assumption." *Criminology* 37 (2): 405-426.

Owens, Michael Leo (1997). "Renewal in a Working Class Black Neighborhood." *Journal of Urban Affairs* 19 (2): 183-205.

Pandit, Kavita and Suzanne Davies Withers (1999). *Migration and Restructuring in the United States: A Geographic Perspective*. Maryland: Rowman and Littlefield Publishers, Inc.

Park, Robert E., Ernest W. Burgess, and Roderick D. McKenzie (1925). *The City*. Chicago: University of Chicago Press [1984].

Parker, Karen F. and Matthew V. Pruitt (2000). "Poverty, Poverty Concentration, and Homicide." *Social Science Quarterly* 81 (2): 555-570.

Parker, Robert Nash and M. Dwayne Smith (1979). "Deterrence, Poverty, and Type of Homicide." *American Journal of Sociology* 85 (3): 614-624.

Patillo-McCoy, Mary (1999). *Black Picket Fences: Privilege and Peril Among the Black Middle Class*. Chicago: University of Chicago Press.

- Peterson, Paul E. (1991). "The Urban Underclass and the Poverty Paradox." In Jencks and Peterson (Eds.), *The Urban Underclass*. Washington D.C.: The Brookings Institute.
- Peterson, Ruth D. and Lauren J. Krivo (1993). "Racial Segregation and Black Urban Homicide." *Social Forces* 71 (4): 1001-1026.
- Peterson, Ruth D. and Lauren J. Krivo (2005). "Macrostructural Analyses of Race, Ethnicity, and Violent Crime: Recent Lessons and New Directions for Research." *Annual Review of Sociology* 31: 331-356.
- Peterson, Ruth D., Lauren J. Krivo, and Mark A. Harris (2000). "Disadvantage and Neighborhood Crime: Do Local Institutions Matter?" *Journal of Research in Crime and Delinquency* 37 (1): 31-63.
- Platt, Jennifer (1992). "'Case Study' in American Methodological Thought." *Current Sociology* 40 (1): 17-48.
- Powell, Elwin H. (1988). *The Design of Discord: Studies of Anomie: Suicide, Urban Society, and War*, Second Edition. New Jersey: Transaction Publishers.
- Price, Alfred D. (1991). "Urban Renewal: The Case of Buffalo, NY." *Review of Black Political Economy* 19 (3/4): 125-160.
- Putnam, Robert D. (2000). *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon & Schuster.
- Pyle, David (1998). "Crime and Unemployment: What do Empirical Studies Show?" *International Journal of Risk Security and Crime Prevention* 3 (3): 169-180.
- Quetelet, Adolphe J. (1831). *Research on the Propensity for Crime at Different Ages*. Translated and Introduced by Sawyer F. Sylvester. Cincinnati: Anderson Publishing Company [1984].
- Ragin, Charles and Howard Becker (Eds.) (1992). *What is a Case? Exploring the Foundations of Social Inquiry*. Cambridge: Cambridge University Press.
- Ratcliffe, J.H. and M.J. McCullagh (1999). "Hotbeds of Crime and the Search for Spatial Accuracy." *Journal of Geographical Systems* 1 (4): 385-398.
- Reid, Lesley Williams, Harald E. Weiss, Robert M. Adelman, and Charles Jaret (2005). "The Immigration-Crime Relationship: Evidence across US Metropolitan Areas." *Social Science Research* 34 (4): 757-780.
- Ricketts, Erol R. and Isabel V. Sawhill (1988). "Defining and Measuring the Underclass." *Journal of Policy Analysis and Management* 7 (2): 316-325.

- Riis, Jacob A. (1902). *The Battle with the Slum*. New York: Dover Publications, Inc [1998].
- Rohe, William M. and Victoria Basolo (1997). "Long-Term Effects of Homeownership on the Self-Perceptions and Social Interaction of Low Income Persons." *Environment and Behavior* 29 (6): 793-819.
- Roncek, Dennis W. (1981). "Dangerous Places: Crime and Residential Environment." *Social Forces* 60 (1): 74-96.
- Rosenfeld, Richard (2000). "Patterns in Adult Homicide: 1980-1995." In Blumstein and Wallman (Eds.), *The Crime Drop in America*. Cambridge: Cambridge University Press, pp. 130-163.
- Ross, M (1977). *Economics, Opportunity, and Crime*. Montreal: Renouf.
- Sampson, Robert J. (1987). "Urban Black Violence: The Effect of Male Joblessness and Family Disruption." *American Journal of Sociology* 93 (2): 348-382.
- Sampson, Robert J. and W. Byron Groves (1989). "Community Structure and Crime: Testing Social Disorganization Theory." *American Journal of Sociology* 94 (4): 774-802.
- Sampson, Robert J. and John D. Wooldredge (1987). "Linking the Micro- and Macro-Level Dimensions of Lifestyle-Routine Activity-Opportunity Models of Predatory Victimization." *Journal of Quantitative Criminology* 3 (4): 371-393.
- Sampson, Robert J. and John H. Laub (1990). "Crime and Deviance over the Life Course: The Salience of Adult Social Bonds." *American Sociological Review* 55 (5): 609-627.
- Sampson, Robert J. and Janet L. Lauritsen (1994). "Violent Victimization and Offending: Individual-, Situational-, and Community-level Risk Factors." In Reiss, Jr., and Roth (Eds.), *Understanding and Preventing Violence: Social Influences*, Volume 3. National Research Council. Washington, D.C.: National Academy Press, pp. 1-114.
- Sampson, Robert J. and William Julius Wilson (1995). "Toward a Theory of Race, Crime, and Urban Inequality." In John Hagan and Ruth D. Peterson (Eds.), *Crime and Inequality*. Stanford, CA: Stanford University Press, pp. 37-54.
- Sampson, Robert J. and Jeffrey D. Morenoff (1997). "Ecological Perspectives on the Neighborhood Context of Urban Poverty: Past and Present." In Brooks-Gunn, Duncan, and Aber (Eds.), *Neighborhood Poverty: Vol II: Policy Implications in Studying Neighborhoods*. New York: Russell Sage Foundation, pp. 1-22.
- Sampson, Robert J., Steven W. Raudenbush, and Felton Earls (1997). "Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy." *Science* 277 (5328): 918-924.

- Sampson, Robert J., Jeffrey D. Morenoff, and Felton Earls (1999). "Beyond Social Capital: Spatial Dynamics of Collective Efficacy for Children." *American Sociological Review* 64 (5): 633-660.
- Sampson, Robert J., Jeffrey D. Morenoff, and Thomas Gannon-Rowley (2002). "Assessing 'Neighborhood Effects': Social Processes and New Directions in Research." *Annual Review of Sociology* 28: 443-478.
- Schurman, Leo and Solomon Kobrin (1986). "Community Careers in Crime." In Reiss, Jr., and Tonry (Eds.), *Communities and Crime*. Chicago: University of Chicago Press, pp. 67-100.
- Shaw, Clifford R. and Henry D. McKay (1942). *Juvenile Delinquency and Urban Areas*. Chicago: University of Chicago Press [1969].
- Shaw, Clifford R. and Henry D. McKay (1949). "Rejoinder." *American Sociological Review* 14 (5): 614-617.
- Sheley, Joseph F. and Cindy D. Ashkins (1981). "Crime, Crime News, and Crime Views." *Public Opinion Quarterly* 45 (4): 492-506.
- Sherman, Lawrence W. (1997). "Communities and Crime Prevention." In Sherman, Gottfredson, MacKenzie, Eck, Reuter, and Bushway (Eds.), *Preventing Crime: What Works, What Doesn't, What's Promising*. NCJ-165366. Washington: Office of Justice Programs.
- Shihadeh, Edward S. and Wesley Shrum (2004). "Serious Crime in Urban Neighborhoods: Is There a Race Effect?" *Sociological Spectrum* 24 (4): 507-533.
- Shinn, Marybeth and Siobhan M. Toohey (2003). "Community Contexts of Human Welfare." *Annual Review of Psychology* 54: 427-459.
- Skogan, Wesley G. (1990). *Disorder and Decline: Crime and the Spiral of Decay in Urban Neighborhoods*. Berkeley: University of California Press.
- Small, Mario Luis and Katherine Newman (2001). "Urban Poverty after *The Truly Disadvantaged*: The Rediscovery of the Family, the Neighborhood, and Culture." *Annual Review of Sociology* 27: 23-45.
- Sorenson, Susan B., Julie G. Peterson Manz, and Richard A. Berk (1998). "News Media Coverage and the Epidemiology of Homicide." *American Journal of Public Health* 88 (10): 1510-1514.
- South, Scott J. and Kyle D. Crowder (1998). "Housing Discrimination and Residential Mobility: Impacts for Blacks and Whites." *Population Research and Policy Review* 17 (4): 369-387.

South, Scott J. and Glenn D. Deane (1993). "Race and Residential Mobility: Individual Determinants and Structural Constraints." *Social Forces* 72 (1): 147-167.

South, Scott J. and Steven F. Messner (2000). "Crime and Demography: Multiple Linkages, Reciprocal Relations." *Annual Review of Sociology* 26: 83-106.

Squires, Gregory D. and Charis E. Kubrin (2005). "Privileged Places: Race, Uneven Development and the Geography of Opportunity in Urban America." *Urban Studies* 42 (1): 47-68.

Stretesky, Paul B., Amie M. Schuck, and Michael J. Hogan (2004). "Space Matters: An Analysis of Poverty, Poverty Clustering, and Violent Crime." *Justice Quarterly* 21 (4): 817-841.

Sugrue, Thomas J. (1996). *The Origins of the Urban Crisis: Race and Inequality in Postwar Detroit*. New Jersey: Princeton University Press.

Sullivan, Mercer (1989). *"Getting Paid": Youth Crime and Work in the Inner City*. Ithaca: Cornell University Press.

Sutherland, Edwin H. (1934). *Principles of Criminology*. Chicago: Lippincott.

Suttles, Gerald D. (1968). *The Social Order of the Slum*. Chicago: University of Chicago Press.

Suttles, Gerald D. (1972). *The Social Construction of Communities*. Chicago: University of Chicago Press.

Taylor, Henry Louis, Jr. (1991). "Social Transformation Theory, African Americans and the Rise of Buffalo's Post-Industrial City." *Buffalo Law Review* 39: 569-606.

Taylor, Jr., Henry Louis and Sam Cole (2001). "Structural Racism and Efforts to Radically Reconstruct the Inner-City Built Environment." Presented at the 43<sup>rd</sup> *Associate of Collegiate Schools of Planning* conference, Cleveland Ohio.

Taylor, Ralph B. and Jeanette Covington (1988). "Neighborhood Changes in Ecology and Violence." *Criminology* 26 (4): 553-589.

Thacher, David (2006). "The Normative Case Study." *American Journal of Sociology* 111 (6): 1631-1676.

Tienda, Marta and Haya Stier (1991). "Joblessness or Shiftlessness: Labor Force Activity in Chicago's Inner City." In Jencks and Peterson (Eds.), *The Urban Underclass*. Washington, D.C.: Brookings Institute, pp. 135-154.

Tita, George and Elizabeth Griffiths (2005). "Traveling to Violence: The Case for a Mobility-Based Spatial Typology of Homicide." *The Journal of Research in Crime and Delinquency* 42 (3): 275-308.

Trattner, Walter I. (1970). *Crusade for the Children: A History of the National Child Labor Committee and Child Labor Reform in America*. Chicago: Quadrangle Books.

Turner, Susan C. (1991). "Economic Development in Buffalo: Community, Change and Fragmentation." *Buffalo Law Review* 39: 429-443.

Uggen, Christopher (2000). "Work as a Turning Point in the Life Course of Criminals: A Duration Model of Age, Employment, and Recidivism." *American Sociological Review* 65 (4): 529-546.

United States Bureau of the Census (2000). "Appendix A: Census 2000 Geographic Terms and Concepts." <http://www.census.gov/geo/www/tiger/glossry2.pdf>

U.S. Bureau of the Census (1965). "Low Income Families and Unrelated Individuals in the U.S.: 1963." Series P-60 No. 45, June.

U.S. Bureau of the Census (1969). "Year-Round Workers with Low Earnings in 1966." Series P-60 No. 58, April.

U.S. Census Bureau, Census 1990 STF3.

U.S. Census Bureau, Census 2000 SF1, SF2, SF3 and SF4.

U.S. Department of Housing and Urban Development (1997). FY 1997 HOPE VI Revitalization Grants, accessed August 2006 at: [www.hud.gov/offices/pih/programs/ph/hope6/grants/revitalization/97gtes.pdf](http://www.hud.gov/offices/pih/programs/ph/hope6/grants/revitalization/97gtes.pdf)

Van Vechten, C.C. (1941). "The Criminality of the Foreign Born." *Journal of the American Institute of Criminal Law and Criminology* 32 (2): 139-147.

Van Wilsem, Johan, Karin Wittebrood, and Nan Dirk De Graff (2006). "Socioeconomic Dynamics of Neighborhoods and the Risk of Crime Victimization: A Multilevel Study of Improving, Declining, and Stable Areas in the Netherlands." *Social Problems* 53 (2): 226-247.

Van Wyk, Judy A., Michael L. Benson, Greer Litton Fox, and Alfred DeMaris (2003). "Detangling Individual-, Partner-, and Community-Level Correlates of Partner Violence." *Crime & Delinquency* 49 (3): 412-438.

Von Hoffman, Alexander (2003). *House by House, Block by Block: The Rebirth of America's Urban Neighborhoods*. Oxford: Oxford University Press.



Wacquant, Loic J. D. and William Julius Wilson (1989). "The Cost of Racial Exclusion in the Inner City." *Annals of the American Academy of Political and Social Science* 501: 8-25.

Weinberg, Daniel H. (1995). "Measuring Poverty: Issues and Approaches." U.S. Bureau of the Census, Washington D.C. (December).

Whalen, Charles J. (1987). "Consensus Mechanisms and Community Economic Development: The Buffalo Experience." *Journal of Economic Issues* 21 (2): 763-774.

White, Garland F. (2001). "Home Ownership: Crime and the Tipping and Trapping Processes." *Environment and Behavior* 33 (3): 325-342.

Wikström, Per-Olaf H. (1995). "Preventing City-Center Street Crimes." In Tonry and Farrington (Eds.), *Building a Safer Society: Strategic Approaches to Crime Prevention: Crime and Justice: A Review of Research*. Chicago: University of Chicago Press, pp. 429-468.

Wilcox, Pamela, Kenneth C. Land and Scott A. Hunt (2003). *Criminal Circumstance: A Dynamic Multicontextual Criminal Opportunity Theory*. New York: Walter de Gruyter.

Wilkinson, Kenneth P. (1984). "A Research Note on Homicide and Rurality." *Social Forces* 63 (3): 445-452.

Williams, Kirk R. and Robert L. Flewelling (1988). "The Social Production of Criminal Homicide: A Comparative Study of Disaggregated Rates in American Cities." *American Sociological Review* 53 (3): 421-431.

Wilson, James Q. and George L. Kelling (1982). "The Police and Neighborhood Safety." *The Atlantic Monthly*, March: 29-38.

Wilson, William Julius (1987). *The Truly Disadvantaged: The Inner City, the Underclass, and Public Policy*. Chicago: University of Chicago Press.

Wirth, Louis (1964). *Urbanism as a Way of Life*. Chicago: University of Chicago Press.

Wolcott, Victoria W. (2006). "Recreation and Race in the Postwar City: Buffalo's 1956 Crystal Beach Riot." *The Journal of American History* 93 (1): 63-90.

Wolfgang, Marvin (1958). *Patterns of Criminal Homicide*. Philadelphia: University of Pennsylvania Press.

Wooldredge, John and Amy Thistlewaite (2003). "Neighborhood Structure and Race-Specific Rates of Intimate Assault." *Criminology* 41 (2): 393-422.

Zahn, Margaret A. (1989). "Homicide in the Twentieth Century: Trends, Types, and Causes." In Gurr (Ed.), *Violence in America: Volume 1: The History of Crime*. Newbury Park: Sage Publications, pp. 216-234.