INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or “target” for pages apparently lacking from the document photographed is “Missing Page(s)”. If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.

2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of “sectioning” the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.

4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.
Mergler, Golden Jackson

SPATIAL PATTERNS AND PROCESSES OF GENTRIFICATION

The Ohio State University

University Microfilms International

300 N. Zeeb Road, Ann Arbor, MI 48106

PH.D. 1984
PLEASE NOTE:

In all cases this material has been filmed in the best possible way from the available copy. Problems encountered with this document have been identified here with a check mark ✓.

1. Glossy photographs or pages
2. Colored illustrations, paper or print
3. Photographs with dark background
4. Illustrations are poor copy
5. Pages with black marks, not original copy
6. Print shows through as there is text on both sides of page
7. Indistinct, broken or small print on several pages
8. Print exceeds margin requirements
9. Tightly bound copy with print lost in spine
10. Computer printout pages with indistinct print
11. Page(s) lacking when material received, and not available from school or author.
12. Page(s) seem to be missing in numbering only as text follows.
13. Two pages numbered. Text follows.
14. Curling and wrinkled pages
15. Other Dissertation contains pages with print at a slant, filmed as received.

University Microfilms International
Spatial Patterns and Processes of Gentrification

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By
Golden Jackson Mergler, B.S., M.S.

* * * * *

The Ohio State University
1984

Reading Committee: Approved By
Lawrence A. Brown, Ph.D. Kevin R. Cox
Kevin R. Cox, Ph.D.
Henry L. Hunker, Ph.D.
W. Randy Smith, Ph.D. Kevin R. Cox

Geography
ACKNOWLEDGMENTS

Study in the Department of Geography at The Ohio State University has provided new perspectives and ways of thinking. I consider myself fortunate to have been associated with this group of faculty. A special acknowledgement is due Kevin Cox, my advisor, for his direction and support throughout my graduate studies.

Many friends have made specific contributions to the writing of this dissertation, including provision of a workplace, computer terminal, child care, and diversion. My sincere thanks go to each of them. I also wish to thank my parents for guidance and support in all academic endeavors.

Finally, to Norwin, for keeping the home fires burning, and to Eldon, for keeping things in perspective--thank you.
VITA

February 23, 1949 ............ Born Rosedale, Mississippi

1971 ........................ B. S., Mississippi State College for Women, Columbus, Mississippi

1973 ........................ M. S., University of North Carolina at Greensboro, Greensboro, North Carolina

1973-1974 .................... Instructor, Department of Home Management, College of Home Economics, University of Rhode Island, Kingston, Rhode Island

1974-present ............... Instructor, Department of Home Management and Housing, College of Home Economics, The Ohio State University, Columbus, Ohio

1980 ......................... Research Associate, Department of Geography, The Ohio State University, Columbus, Ohio

Publications

"Gentrification and Urban Form," Research Report No. 27, Center for Real Estate Education and Research, The Ohio State University, 1982, with Kevin R. Cox.

Fields of Study

Major Field: Political Geography

Resource Allocation and Conflict in an Urban Setting. Professor K. Cox
Social Thought and the City. Professor K. Cox

Minor Field: Urban Geography

Housing Market. Professor O. Fisch
Urban Social Geography. Professor L. Brown
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Acknowledgments</th>
<th>ii</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vita</td>
<td>iii</td>
</tr>
<tr>
<td>List of Figures</td>
<td>viii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>x</td>
</tr>
</tbody>
</table>

**Chapter**

**I. Introduction**

- Significance of Gentrification                       | 2  |
- Gentrification and The "Post-Industrial" City        | 4  |
- Residential Reinvestment in Inner-Columbus Neighborhoods | 7  |
- Overview of the Study                                | 13 |

**II. Review of Selected Literature**

- A Characterization of Reinvestment                   | 16 |
- Urban Reinvestment Defined                           | 16 |
- Correlates of Reinvestment                           | 17 |
- The Gentrification Process                           | 21 |
- Gentrification As A Demand-Led Market Process        | 22 |
- Housing Type                                         | 24 |
- Employment Accessibility                             | 25 |
- Young, Childless Households                          | 26 |
- The Role of Interest Groups in the Gentrifying Process | 29 |
The Role of the State 35
Alternative Explanations of
Gentrification 41
Structural Tendencies Creating the
Possibility of Gentrification 42
Summary 48
Research Questions 49

III. Spatial and Temporal Patterns of
Gentrification 52
The Return of the Middle Class to the
Inner City: Central City/Suburb
Contrasts 53
The Middle Class Return to the Inner
City: The Pure Case 61
The Middle Class Return to the Inner
City: The Ratio Case 65
Differentiation Within the Inner City 68
Differences in Property Values and
Homeownership Rates 69
Changes in Property Values 73
A Factor Analysis of Inner-City
Neighborhoods 75
Patterns of Change within Gentrified
Areas 81
Point Pattern Analysis 85
Spatial Diffusion 107
Summary 116

IV. The Gentrification Process 119
Gentrification Within the Post-Industrial
City 121
Characteristics of Residents 124
Selection-out of Gentrified Neighborhoods 131
Neighborhood Characteristics 131
Role of Urban Renewal 134
Random Origin and Contagion Processes 136
The Real Estate Investment Process 142
Data Collection 145
Owners of German Village Property 146
Summary 155

V. Summary 157
Spatial and Temporal Patterns of
Gentrification 158
LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>The Central City of Columbus, Ohio</td>
<td>8</td>
</tr>
<tr>
<td>2.</td>
<td>German Village</td>
<td>9</td>
</tr>
<tr>
<td>3.</td>
<td>Victorian Village</td>
<td>10</td>
</tr>
<tr>
<td>4.</td>
<td>Rehabilitation Projects Per Year, German Village, 1960-1980</td>
<td>12</td>
</tr>
<tr>
<td>5.</td>
<td>Rehabilitation Projects Per Year, Victorian Village, 1960-1980</td>
<td>13</td>
</tr>
<tr>
<td>6.</td>
<td>Four Types of Middle Class Return to the Inner City</td>
<td>57</td>
</tr>
<tr>
<td>7.</td>
<td>Middle Class Densities and Distance from the CBD</td>
<td>64</td>
</tr>
<tr>
<td>8.</td>
<td>Occupational Composition and Distance from the CBD, Columbus, Ohio, 1950, 1960, 1970, 1980</td>
<td>67</td>
</tr>
<tr>
<td>9.</td>
<td>Eighteen Neighborhoods Within Two Miles of the Columbus, Ohio, City Center</td>
<td>77</td>
</tr>
<tr>
<td>10.</td>
<td>Residential Properties Rehabilitated, German Village, Columbus, Ohio, 1960-1965</td>
<td>86</td>
</tr>
<tr>
<td>11.</td>
<td>Residential Properties Rehabilitated, German Village, Columbus, Ohio, 1960-1970</td>
<td>87</td>
</tr>
<tr>
<td>12.</td>
<td>Residential Properties Rehabilitated, German Village, Columbus, Ohio, 1960-1975</td>
<td>88</td>
</tr>
<tr>
<td>13.</td>
<td>Residential Properties Rehabilitated, German Village, Columbus, Ohio, 1960-1980</td>
<td>89</td>
</tr>
<tr>
<td>14.</td>
<td>Residential Properties Rehabilitated, Victorian Village, Columbus, Ohio, 1960-1965</td>
<td>90</td>
</tr>
</tbody>
</table>
15. Residential Properties Rehabilitated, Victorian Village, Columbus, Ohio, 1960-1970 . 91

16. Residential Properties Rehabilitated, Victorian Village, Columbus, Ohio, 1960-1975 . 92

17. Residential Properties Rehabilitated, Victorian Village, Columbus, Ohio, 1960-1980 . 93

18. Mean Dates of German Village Rehabilitation: At Least $10,000 Investment ............. 109

19. Mean Dates of German Village Rehabilitation: All Properties .......................... 110

20. Growth Poles and Sinks—German Village .......... 112

21. Growth Poles and Sinks—German Village, All Properties .............................. 114

22. Mean Dates of Victorian Village Rehabilitation: At Least $10,000 Investment .... 115

23. Mean Dates of Victorian Village Rehabilitation: All Properties ................. 116


27. A Simulated Random Distribution of Events Across Five Neighborhoods and Five Points in Time ........................................ 139
## LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Percent of all Homeowners by Family Status Categories, 1950-1980</td>
<td>27</td>
</tr>
<tr>
<td>2.</td>
<td>Percent of All Renters by Family Status Categories, 1950-1980</td>
<td>28</td>
</tr>
<tr>
<td>3.</td>
<td>White Collar Densities and Distance from the CBD, Columbus, Ohio, 1950, 1960, 1970, 1980</td>
<td>62</td>
</tr>
<tr>
<td>4.</td>
<td>Occupational Composition and Distance from the CBD, Columbus, Ohio, 1950, 1960, 1970, 1980</td>
<td>66</td>
</tr>
<tr>
<td>5.</td>
<td>Changes in Homeownership Rates in Randomly Selected Blocks Located Within One-and-one-half Miles of the Columbus, Ohio, CBD, 1950-1980</td>
<td>70</td>
</tr>
<tr>
<td>6.</td>
<td>Changes in Property Values in Randomly Selected Blocks Located Within One-and-one-half Miles of the Columbus, Ohio, CBD, 1950-1980</td>
<td>71</td>
</tr>
<tr>
<td>7.</td>
<td>Property Values for Census Blocks As A Function of Earlier Values and Location in A Gentrified Area, Columbus, Ohio, 1960-1980</td>
<td>74</td>
</tr>
<tr>
<td>8.</td>
<td>Differences in Slope and Intercept for Gentrified and Non-Gentrified Areas: Property Values as a Function of Earlier Values and Location</td>
<td>75</td>
</tr>
<tr>
<td>9.</td>
<td>Factor Loadings—Factor Analysis of Sixteen Variables</td>
<td>76</td>
</tr>
<tr>
<td>10.</td>
<td>Factor Scores of Eighteen Neighborhoods</td>
<td>79</td>
</tr>
<tr>
<td>11.</td>
<td>A Sample Quadrat Count Analysis</td>
<td>94</td>
</tr>
<tr>
<td>12.</td>
<td>Observed and Expected Frequencies for</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Observed and Expected Frequencies for Rehabilitated Houses in German Village: All Properties and &quot;Small&quot; Quadrats</td>
<td>100</td>
</tr>
<tr>
<td>14.</td>
<td>Observed and Expected Frequencies for Rehabilitated Houses in German Village: All Properties and &quot;Large&quot; Quadrats</td>
<td>101</td>
</tr>
<tr>
<td>15.</td>
<td>Observed and Expected Frequencies for Rehabilitated Houses in German Village: At Least $10,000 Investment and &quot;Small&quot; Quadrats</td>
<td>102</td>
</tr>
<tr>
<td>20.</td>
<td>Growth Poles and Sinks: Rehabilitation Investment In German Village of At Least $10,000</td>
<td>111</td>
</tr>
<tr>
<td>21.</td>
<td>Growth Poles and Sinks: All Rehabilitated Properties, German Village</td>
<td>113</td>
</tr>
<tr>
<td>22.</td>
<td>Marital Status of Central City Residents, 1950-1980</td>
<td>125</td>
</tr>
<tr>
<td>23.</td>
<td>Occupation of Central City Residents, 1950-1980</td>
<td>126</td>
</tr>
<tr>
<td>24.</td>
<td>Comparison Between White Collar and Blue Collar Workers in Inner-City Areas, 1950-1980</td>
<td>128</td>
</tr>
<tr>
<td>25.</td>
<td>Place of Employment for Central City Residents, 1950-1980</td>
<td>129</td>
</tr>
</tbody>
</table>
26. Average Housing Values in German Village and Non-Gentrified Areas, 1950-1980

27. Percentage of Dilapidated Housing Units in German Village and Non-Gentrified Areas, 1950-1980

28. Percentage of Vacant Housing Units in German Village and Non-Gentrified Areas, 1950-1980

29. Investment in German Village Property, 1950-1980

30. Differences in Investment by Real Estate Professionals Versus All Other Investor Types, German Village, 1950-1980

31. Amount of Investment in German Village Property Rehabilitation by Real Estate Professionals Versus All Other Investor Types, 1950-1980

32. Length of Ownership of German Village Properties by Type of Investor

33. Resident Landlord Investors in German Village, 1960-1980

34. Number of Properties Per Owner for Multi-Owners in German Village

35. Investment in Rehabilitation by Owners of More Than One German Village Property, 1960-1980
Chapter I

INTRODUCTION

This dissertation is about gentrification. The term gentrification, variously referred to as middle class rehabilitation, middle class reinvestment, or urban revitalization, is generally taken to designate investment in inner-city,(1) lower-income neighborhoods for use by middle class occupants. The emphasis is on renovation as well as on shifts in population.

Widespread interest currently exists in the residential rehabilitation of inner city neighborhoods for middle class use. Attention has been paid to gentrification primarily for two reasons. First, the phenomenon has generated controversy over its supposed effect of displacing low-income residents from inner-city neighborhoods; and second, the occurrence of gentrification has been widespread. Indeed, the phenomenon, widely recognized during the 1970's, has been documented in all major U.S. cities as well as in cities of other developed countries (Clay, 1979, 1983; and

(1) The term inner city refers to to residential areas, generally regarded as undesirable by virtue of dilapidation, crime, poor schools, etc., surrounding the central business district.
In this study the objective is to fill in some of the lacunae found in research on gentrification: e.g., explanations for the precise locations of gentrification, and the link between gentrification and shifts in the urban process at economic and sociocultural levels. More specifically, the intent is to examine the spatial patterns and process of gentrification at three scales—urban, inner city, and neighborhood.

SIGNIFICANCE OF GENTRIFICATION

Middle class rehabilitation is not significant with respect to total housing production; it is important, however, because of the controversy it has generated in the many cities where it has occurred. Gentrification has been heralded by some as a needed "shot in the arm" to revitalize "dying" cities. On the other hand, it has also been criticized for displacing low income residents.

Disagreement on the issue of gentrification can be observed both within and between interest groups (e.g., urban government, low-income residents, developers, middle-class residents) as well as within the ranks of academe. Perspectives of interest groups vary. For fiscally pressed central city governments, middle class rehabilitation and the potential for an appreciating tax base is wel-
Long-term residents, on the other hand, fear displacement. Developers may be in opposition to both long-term and new residents over questions of costs, density, style, or type of development.

Urban theorists vary in their theoretical approach to gentrification. Gentrification has been studied from both positivistic/neo-classical economic and marxist perspectives. Within a positivistic framework, most work has focused on developing a list of factors associated with gentrification (e.g., demographic, economic, location, employment). Relationships between factors are seen as purely quantitative, i.e., creating more or less of something. Thus, discussions of interaction among factors proceed from a view of consumers, developers, the state, as self-sufficient entities with characteristics intrinsic to themselves. Qualitative changes, as for example, those of an institutional nature, are generally not considered.

Not all urban theorists working from a positivistic approach agree, however, on the significance of the gentrification phenomenon. Two schools of thought have emerged. One group argues that gentrification is temporary because the factors encouraging the phenomenon are temporary—an aberration. In contrast, advocates of the urban revitalization school see gentrification as part of a larger picture of recentralization of certain types of activities.
Finally, from an opposing theoretical view, marxists see gentrification as part of an outcome of a set of material conditions produced by particular and necessarily conflictual social relations. In this study the latter view is adopted for its capacity "to explain both the diversity of urban forms . . . as well as complete exceptions to the rule" (Smith, 1983, p. 11).

GENTRIFICATION AND THE "POST-INDUSTRIAL" CITY

Gentrification must be seen in relation to changes in the urban process at economic, political, and socio-cultural levels. These changes have been associated with the emergence of a so-called post-industrial society, generally referring to societal transformations observed since World War II. With respect to the economy there has been a decline in the role of unskilled labor and an increase in the importance of technology, the dominance of white collar employment and a shift to a service economy. Documentation of this shift has been provided by Harris (1983): thus the manufacturing labor force in the U.S. reached its peak in 1973 (32.5 percent) and has declined since. Further, employment in service occupations increased from forty-eight percent in 1951 to 54.5 percent in 1973. Politically, the role of the state is more evident and more widespread. Again, Harris (1983) reported a 55.6 percent
increase in public employment during the years 1950-1970. Socioculturally, a shift in, e.g., work patterns, household composition, societal values has been observed (Ley, 1980). For example, the percentage of employed wives in husband/wife households increased 276.1 percent between 1947 and 1980, and the labor force participation rate for wives more than doubled (23.8 percent in 1950 to 50.2 percent in 1980). With respect to household composition, traditional husband/wife households comprised only 60.9 percent of all households in 1980, a decrease of eighteen percent since 1960. (Sternleib, Hughes, and Hughes, 1982).

Work by Stanback and Noyelle (1982 provides empirical evidence for this shift in the U.S. city. Their analysis supports the observation that

a major structural transformation (is) manifested by a disproportionately high growth of many and varied service activities and a rapid white collarization of its labor force within both service and nonservice industries; (and) second, that this transformation has resulted in a concomitant restructuring of the urban system in which the fast-growing services and the rapidly expanding white collar occupations have differentially altered both the industrial composition of metropolitan centers and the nature of work in such places (Stanback and Noyelle, 1982, p. 1).

Stanback and Noyelle further attribute the rise in white collar occupations to the centralization of administrative and planning functions within the large corporation and by fast-paced changes in technology associated with production and service delivery (Stanback and Noyelle, 1982, p. 133).
One of the cities selected for study by Stanback and Noyelle was Columbus, Ohio. Columbus was included in the sample as an example of the transition to a service economy despite its location in the heart of an industrial state. Economic transition in Columbus was facilitated in part by its position as the center of state government, with the state being the largest employer (over 20,000 employees in 1976 and 12,000 federal government employees). It is also the location of the administrative headquarters of several large corporations, e.g., Borden, and is a center for the insurance industry (forty firms, including Nationwide, are located there). Finally, Columbus has a strong research base with Battelle Memorial Institute (2900 employees), Chemical Abstracts Service (1200 employees) and The Ohio State University (14,500 employees). Most of these functions/institutions are located in the central business district or within two miles of the city center.

Stanback and Noyelle examined only shifts in employment structure in Columbus and other cities. However, changes in employment structure have been accompanied in many cities by changes in residential patterns, specifically rehabilitation of inner-city neighborhoods for middle class use. Columbus is no exception to this pattern. Therefore, Columbus may provide an appropriate setting for a study of change in inner-city residential patterns within a "post-industrial" city.
RESIDENTIAL REINVESTMENT IN INNER-COLUMBUS NEIGHBORHOODS

In Columbus, gentrification of lower-income neighborhoods began around 1960. The first instance was a neighborhood just south of the CBD known as German Village. Middle class reinvestment in a second neighborhood, Victorian Village, was observed in the early 1970's. German Village is located directly south of the Columbus central business district (see Figure 1 and Figure 2); it is bounded on the north by an interstate highway and contains a park near the southern boundary. Victorian Village lies northwest of the CBD and just south of the The Ohio State University campus (see Figure 1 and Figure 3). There is a commercial strip on the eastern border and on part of the northern boundary. A hospital is located in the center of the area, and an extensive urban renewal project for middle class residential use is on the southern border.

German Village was first settled by working-class German immigrants in the early 1800s (Berry, 1979). According to Berry, many of the first residents were employed by breweries located in the same area. Settlement of the Victorian Village area, she argues, came later, with construction of the first houses in 1860, and most of the larger homes were built by 1875. Residents were upper class and professionals—including a judge, historian, architect, and circus entrepreneur. Accordingly, houses in Victorian Vil-
Figure 1: The Location of German Village and Victorian Village, Columbus, Ohio
Figure 2: German Village
Figure 3: Victorian Village
lage are larger and more ornate than in German Village. The Victorian style homes are two story (or more) brick or stone structures with features such as stained and leaded glass windows, large porches, turrets, and domes. German Village dwellings are one and one-and-one-half story four-room brick structures laid out on small lots along narrow brick streets.

Victorian Village is the smaller of the two neighborhoods. According to City of Columbus Code Enforcement Department files, there are just over 1000 properties in Victorian Village and 1577 in German Village. The 1980 City Directory listed 2264 addresses in German Village and 1689 in Victorian Village.

Reinvestment in the two neighborhoods began at different time periods, with interest in German Village increasing during the late 1950s and early 1960s (see Figure 4) and activity in Victorian Village beginning almost a decade later (see Figure 5). During the period 1960-1980, one hundred seventy-three properties were rehabilitated within Victorian Village with an investment of at least $5000; fifty-one properties had investments of at least $10,000. In German Village, a $5000 or more investment was made in five hundred thirty-four properties, while at least $10,000 were invested in the rehabilitation of two hundred sixty-two properties. The pattern of investment and the invest-
ment process in these two neighborhoods are further analyzed in this study.

Figure 4: Rehabilitation Projects Per Year, German Village, 1960-1980. ______ $5000-$9999 (including garage construction). ______ $10,000 or more (including new construction). (Source: Building Permit Records, Office of Code Enforcement, City of Columbus).
OVERVIEW OF THE STUDY

Four topics relating to the pattern and process of gentrification are explored in this study:

1. the spatial pattern of gentrification;
2. the role of investors in the gentrification process;
3. the explanation for location of gentrification;
4. the link between middle class rehabilitation and downtown employment shifts.
A review of the literature revealed gaps relating to these four topics; thus, the objective is the development of concepts and presentation of supporting empirical data to fill these lacunae. The literature review is presented in Chapter II. Views of gentrification from a positivistic approach as well as an alternative or marxist response are presented. Spatial and temporal patterns are analyzed in Chapter III, and processes are discussed in Chapter IV. In both cases three scales of analysis are employed—the metropolitan area as a whole, the inner city, and the neighborhood.
Chapter II

REVIEW OF SELECTED LITERATURE

Although middle class reinvestment is not significant with respect to total housing production, it has been documented in all major U.S. cities as well as in cities of other developing nations (Clay, 1979, 1983; Black, 1975). Further, it has generated much interest. This is partly because of the political controversy it has created and also on account of its challenge to traditional theories of urban form. Indeed, a cursory examination of bibliographies revealed fifty books written on gentrification since 1972, and fifty-four articles published in thirty-nine different journals.(2)

This chapter focuses on the descriptions of, and explanations found in the literature for, the gentrification process. Through this review of research on the gentrification phenomenon, additional questions concerning the pattern and process of middle class rehabilitation will be identified. These questions will then serve as the basis for the dissertation.

(2) Articles and books contained in the bibliography for this study and in other bibliographies and pertaining specifically to gentrification were tabulated.
The organization of the chapter is as follows. Middle class reinvestment is defined in the first section; also included is a discussion of characteristics of investors and of gentrified neighborhoods. Examination of the residents and investors in these areas may provide an improved understanding of the process. In the second section, a review of the most frequently encountered perspectives on the reinvestment process is presented. Of interest here are differences in explanations of the gentrification phenomenon as well as aspects of the process left unexplained in the literature. An overview of the dissertation is provided in the final section.

A CHARACTERIZATION OF REINVESTMENT

Urban Reinvestment Defined

Urban reinvestment refers to the process of increased investment in older urban residential neighborhoods. According to Holcomb and Beauregard, investment is made to remodel or rebuild a portion of the urban environment to accommodate more profitable activities and expanded opportunities for consumption, particularly retail and housing for middle and upper-income households (Holcomb and Beauregard, 1981, p. 1).

Other terms used to refer to this process include gentrification, urban revitalization or renaissance, or middle-class rehabilitation. The implication in all cases
is that middle-class homebuyers and landlords and professional developers move into an existing inner-city, lower-income neighborhood and renovate it for use by middle class occupants (Smith, 1982, p. 139). Indeed, Clay puts more emphasis on population change than on physical change (Clay, 1979, p. 6):

The "gentry" create a neighborhood ambience and a style that reflect upper middle class tastes and values; their tastes and values supplant those of the lower income population that dominated the area before revitalization.

**Correlates of Reinvestment**

Clearly observable correlates of gentrification are the location, social characteristics, and housing characteristics of the neighborhoods involved. Rehabilitated neighborhoods are generally located near the central business district or an institutional center. Clay found gentrified areas to be within one mile of the CBD in fifty percent of the cases, and eighty-one percent of the neighborhoods to be located proximate to large-scale public and private improvements such as sports arenas, convention centers, hotels, or office and service complexes (Clay, 1979).

That gentrification occurs proximate to central business districts may indicate that one of the attractions of these neighborhoods for professionals is nearness to their places of employment (Hamnett, 1973; Holman, 1977; Cybriwsky, 1978; and Lipton, 1977). Indeed, Lipton confirmed his
hypothesis that "the mix of high-status, white collar jobs and activities in and around the CBD" is a primary factor influencing middle class rehabilitation (Lipton, 1977, p. 138).

Gentrifiers tend to be young, white, childless professionals. (3) This characterization has held since the rehabilitation during the 1950s of the Foggy Bottom area in Washington. Households rehabilitating this area were mostly professionals or government employees with incomes greater than $8000. Only two of the fifty-two households had school age children. Further, half of the reinvestors were current central city residents, while only three households moved from the suburbs to the city (Nash and Cole-an, 1959, p. 14).

More recent data confirm this description of reinvestors. Recent home buyers in the Capitol Hill area of Washington, D.C., were overwhelmingly white (ninety-four percent), young (forty-eight percent were between the ages of thirty and thirty-four), upper income (90 percent earned more than $15,000), and well-educated (77 percent had more than four years of college) (Gale, 1976).

Particular housing characteristics—style and age—may also be associated with areas of rehabilitation. Clay found Victorian style housing the most common in gentrified

(3) Characteristics of gentrifiers have been documented by Nash and Colean, 1959; Black, 1975; Gale, 1976; Pattison, 1977; Cybriwsky, 1978; and Clay, 1979.
neighborhoods; and in his survey of thirty U.S. cities, he found almost three-fourths of the housing was at least seventy-five years old, and seventy-eight percent of the stock was deteriorating (Clay, 1979).

Neighborhoods proximate to areas of higher status are also likely candidates for reinvestment. The location of the Irish Channel area in New Orleans adjacent to the very fashionable Garden District made the area a prime target for reinvestment (Berry, 1978). In the Philadelphia neighborhood of Fairmount, reinvestment is clustered in the south end nearest an adjoining neighborhood of upper-income white residents (Cybriwsky, 1978). This tendency for reinvestment to occur near areas of higher status has been observed in London as well (Hamnett, 1973). Thus, it appears that the reinvestment process is spatially agglomerative or contagious. In other words, the rehabilitation of three houses on the same block is more likely to spur reinvestment in an adjacent block than in an area twenty blocks away (Winters, 1979; Cybriwsky, 1978; Black, Borut, and Dubinsky, 1977).

Other correlates of inner-city reinvestment are increased housing values and rents, maintenance, and incomes. To obtain a relative measure of reinvestment, James compared central city housing values to suburban values. He attributed the slightly greater increase in
central-city housing values (as compared with suburban housing values) between 1973 and 1976 to reinvestment (James, 1980).

Homeownership is another indicator of reinvestment. The rate of homeownership in central cities increased slightly between 1970 (48.1 percent) and 1975 (49.6 percent) in 1970 compared to 71 percent in 1975) (James, 1980). Winters charted owner occupancy in the upper west side of Manhattan, a gentrifying area, and found that ownership increased 129 percent between 1959 and 1969 in that area, compared to 83 percent for Manhattan and nine percent for all of New York City (Winters, 1979).

Maintenance expenditures have also been used to measure reinvestment. Investment in maintenance in central cities has matched or exceeded suburban investment since 1973. According to a Census survey of home repair and maintenance expenditures, the average expenditure rose 46 percent between 1970 and 1977 in central cities but only 19 percent in suburban areas (James, 1980).

It is apparent from the above discussion that the literature provides evidence on residential trends for the central city as a whole and evidence on who the gentrifiers are but little on the spatial pattern of gentrification. Little attention is paid to spatial patterns exhibited within gentrified neighborhoods or within the inner city or
to changes in spatial patterns over time in the inner city and in the metropolitan area as a whole. Questions concerning pattern include the pattern of diffusion within neighborhoods, i.e., is the "adjacent-neighborhood" contagion process also at work within neighborhoods? Also of interest are patterns at the scale of the central city and the metropolitan area. Examination of patterns at all three scales may provide insight into understanding the gentrification process.

THE GENTRIFICATION PROCESS

Most writing about the gentrification process—how and why the middle class have invested in central city neighborhoods—has taken as its point of departure a positivistic framework emphasizing a plurality of independent and self-sufficient "factors." Individuals as well as interest groups (including the state) are seen as self-sufficient entities with characteristics (e.g., goals or preferences) intrinsic to themselves and owing nothing to their relations with other entities. In other words, consumer demand for older, architecturally interesting housing, or the desire of the state for an enhanced tax base, are viewed as independent, not as socially created, i.e., born of social relationships "which structure and make possible the phenomenal forms" (Cox and Johnston, 1982).
Falling within this broad conception of appropriate theory are attempts at explanation which are of a neo­classical character. Thus, the recent demand for inner city housing is explained by an unexplained change in preference and a different set of supply constraints, i.e., a preference for less space and the budget constraint of higher costs of suburban housing and of energy for commuting and maintaining single family homes.

**Gentrification As A Demand-Led Market Process**

Reviews of the gentrification literature have provided two types of explanation for gentrification based on two independent factors--economic and cultural. In other words gentrification has been driven by changes in the economy and/or culture, independent of social relationships as a whole. A more detailed classification of explanations is provided by London. He views explanations of urban reinvestment by middle class households as falling into four categories:

1. demographic-ecological explanations;
2. sociocultural explanations;
3. political-economic explanations;
4. social movement explanations.

Demographic-ecological explanations emphasize population characteristics such as maturation of the baby-boom population cohort, delayed marriage and childbearing, declining
fertility, increased number of women in the workforce, dual wage-earner families, and increased white-collar employment. Sociocultural explanations focus on values, attitudes, ideas, choices, and beliefs; these explanations adhere to Firey’s "sentiment and symbolism" thesis (Firey, 1945). Political-economic explanations associate middle-class reinvestment with market forces—supply and demand and competition. Explanations classed by London as "social-movement" concern struggles over resources and focus on the involvement of interest groups. These categories may be too specific; explanations of gentrification usually contain components of both sociocultural (including demographics and social movements) and economic explanations.

Most explanation, however, ultimately focuses on consumer preference and the constraints within which these preferences are exercised. The dominant conception, then, of the gentrification process is of a demand-led market process. Demand factors referred to in the literature are threefold:

1. demand for a particular physical type of housing;
2. demand for housing accessible to white collar employment;
3. demand from a qualitatively new sector of the housing market: young, childless singles or married couples.
Housing Type

A common feature of gentrifying neighborhoods is their dominance by housing in an architectural style no longer typical but held to be desirable. Thus, Clay found Victorian style housing the most common in gentrified neighborhoods, although thirty percent of the areas had no identifiable housing style, and seventeen percent of the neighborhoods contained more than one architectural style (Clay, 1979, p. 18). Hamnett (1973, p. 252) also found gentrification likely to occur in London neighborhoods containing houses in the Georgian or Victorian style. In Columbus, both gentrified neighborhoods contain distinct architectural styles—Victorian in Victorian Village and German in German Village.

This association has encouraged the belief that a shift in consumer tastes is responsible for the recent middle class rehabilitation of many inner-city neighborhoods (Berry, 1979; Clay, 1979; Sutton, 1978; and O'Loughlin and Munsiki, 1979). For example, Ford (1979, p. 211) sees preservation as:

a generalized reaction against plastic, modern, sterile environments lacking in depth and texture coupled with a nostalgia for the "good old days" when the pace of life was slower and less complicated. . . . The success of this new preservation represents a growing concern for aesthetics and a wariness toward massive, irreversible change.
A desire for the activity and diversity of urban life is also seen as a force in the development of consumer preference for central city neighborhoods (Winters, 1977). Clay characterized this change in tastes as bound up in "life style" factors that are "difficult to conceptualize." Respondents to his survey reported a desire for "human scale" and interest in conservation (Clay, 1979, p. 16).

**Employment Accessibility**

A second demand factor which appears to be important in the gentrification process is the desire for access to central city employment or to inner city institutional centers such as universities, research institutes, or hospitals (Black, Borut, and Dubinsky, 1977; Clay, 1979; Cybriwsky and Levy, 1979). Thus, Clay found gentrified areas to be within one mile of the central business district in fifty percent of the cases he studied, and eighty-one percent of the neighborhoods were located proximate to public and private improvements such as sports arenas, convention centers, hotels or office and service complexes (Clay, 1979, p. 28).

If indeed employment accessibility is a consideration, it could be a result of either of two conceptually distinct factors: i) an increase in white collar employment; ii) increasing travel costs. Lipton argued from cross-sectional data that both are important (Lipton, 1977, p. 39): "Those cities whose major centers are dominated by
white collar employment and also have the longest commuting distance to the farthest suburbs have strong high status cores."

**Young, Childless Households**

Gentrification also appears to be characterized by a certain demographic specificity. In particular it has been noted that gentrifiers tend to be young and childless (James, 1977, p. 150; Nash and Colean, 1959, p. 14). That this is so is not unreasonable given the widely held image of inner city schools. If the inner city is to be recolonized by the middle class it seems reasonable to expect it to be spearheaded by the childless, though tuition tax credits could alter that bias (Alonso, 1979, p. 131).

On the other hand, it seems unlikely that gentrification could have been as important as it has become without a widening of this particular demographic sector of total housing demand relative to, say, households with children (James, 1977, p. 1607). That this widening has indeed taken place is apparent from the statistics. Table 1 shows the percentage of all owner occupying households in the U.S. as a whole for the years 1950, 1960, 1970, and 1980 respectively, falling in different family status categories. Most striking is the monotonically increasing fractions assumed by single-person and two-person households. All other family status categories register decreasing proportions of all U.S. owner occupying households.
Table 1

Percent of all Homeowners by Family Status Categories, 1950-1980

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Person Households</td>
<td>7.13</td>
<td>8.80</td>
<td>11.85</td>
<td>15.33</td>
<td>+8.20</td>
</tr>
<tr>
<td>2-Person Households</td>
<td>27.41</td>
<td>28.77</td>
<td>30.04</td>
<td>32.75</td>
<td>+5.34</td>
</tr>
<tr>
<td>3-Person Households</td>
<td>22.56</td>
<td>19.37</td>
<td>17.54</td>
<td>18.55</td>
<td>-4.01</td>
</tr>
<tr>
<td>4-Person Households</td>
<td>19.45</td>
<td>18.79</td>
<td>17.41</td>
<td>18.12</td>
<td>-1.33</td>
</tr>
<tr>
<td>All Other Households</td>
<td>23.45</td>
<td>24.27</td>
<td>23.16</td>
<td>15.25</td>
<td>-8.20</td>
</tr>
</tbody>
</table>

Sources:
1970: Census of Housing, Vol. 1, Part 1, Table 4: Utilization Characteristics for the U.S.

To some extent this change in the housing market is short-term due to the working through of the baby-boom cohort (Alonso, 1979). There are, however, other more long-term considerations which are likely to maintain this fraction of the housing market as an important and, in all likelihood, growing one. These include increasing (age adjusted) rates of childlessness, increasing rates of
divorce, and increasingly early ages at which children leave the parental home and establish their own households. For example, during the first half of the 1970's, the number of household formations increased three times as much as the number of individuals (Nye and Page, 1978, p. 30). The growth of one-person households is especially noteworthy: "Between 1970 and 1976 the number of single male homeowners under 35 rose by 213 percent and the number of single female homeowners under 35, by 141 percent" (Hodge, 1979, p. 2). Further, while single-person households are an increasing fraction of all homeowners, their share of the rental market has increased at an even faster rate (see Table 2).

Table 2

Percent of All Renters by Family Status Categories, 1950-1980

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Person Households</td>
<td>12.01</td>
<td>20.71</td>
<td>27.25</td>
<td>36.04</td>
<td>+24.03</td>
</tr>
<tr>
<td>2-Person Households</td>
<td>28.89</td>
<td>26.81</td>
<td>28.88</td>
<td>28.72</td>
<td>- 0.17</td>
</tr>
<tr>
<td>3-Person Households</td>
<td>23.09</td>
<td>18.07</td>
<td>16.61</td>
<td>15.26</td>
<td>- 7.83</td>
</tr>
<tr>
<td>4-Person Households</td>
<td>17.11</td>
<td>14.67</td>
<td>12.12</td>
<td>10.45</td>
<td>- 6.66</td>
</tr>
<tr>
<td>All Other Households</td>
<td>18.90</td>
<td>19.74</td>
<td>15.40</td>
<td>9.53</td>
<td>- 9.37</td>
</tr>
</tbody>
</table>

Sources: See Table 1
The Role of Interest Groups in the Gentrifying Process

Within a positivistic approach, interest groups also are seen as independent entities—groups of individuals (with like goals) seeking what other groups have. Individuals are seen as separate from society, and society is seen as a means to individual goals. Hence, individuals form or use groups to achieve individual goals.

Neighborhood changes associated with gentrification have generated strong divisions of interest among those affected and consequently tend to spawn a variety of interest groups vying for the favors of the state. Groups identified in the literature include newcomers, developers, long-term residents, and the state.

The newcomers: Newcomers to a gentrifying area have an interest in furthering the process with a view to both enhancing the middle class status of the area and further boosting property values. Towards this end neighborhood organizations are formed and city council is lobbied for such things as architectural controls over rehabilitation, zoning changes, and infrastructural improvements such as public parks. Neighborhood consciousness, on the other hand, did not emerge with recent interest in rehabilitating city neighborhoods but has existed a long time. Firey described the activities of the Beacon Hill Association, organized in Boston in 1922, to "keep undesirable business
and living conditions from affecting the Hill District" (Firey, 1945, p. 143). The Beacon Hill group drew up ordinances limiting heights, commercial activity and multi-family housing when Boston was enacting its first zoning code.

Support of local government has also been sought in the area of financing. In Baltimore savers designated the geographical area where they wanted their funds to be loaned, and Community Development Act Block Grant funds were used as reserve accounts in institutions making loans (Black, Borut, and Dubinsky, 1977, p. 6). In Queen Village, Philadelphia, the Neighbors Association used Community Development Act funds to make grants and loans for renovation (Cybriwsky, 1978).

Not all the activity of such voluntary organizations has been directed towards local government, however. The Historic Preservation League in Dallas influenced lenders to support revitalization efforts by providing financial institutions with information about the economic and architectural value of older homes. The group also purchased about ten percent of the houses in a target area and then placed restrictions on the renovation and use of the properties upon resale (Black, Borut, and Dubinsky, 1977, p. 21).

Neighborhood groups have also worked with lenders to screen mortgage applicants:
In one case a group of residents in a partially gentrified neighborhood worked with the bank to screen prospective mortgage applicants for their neighborhood. This arrangement assured the residents that they would get the neighbors they wanted and was viewed by the bank as a way of assuring neighborhood stability (Clay, 1979, p. 29).

Neighborhood groups may also act as support groups for their fellow gentrifiers. The association in Inman Park, Atlanta, held weekly meetings to discuss neighborhood progress and ideas for reducing home improvement costs (A Study of Property Taxes and Urban Blight, 1973, p. 131). Further, the activities of these groups are designed to protect their investment through promotion of the neighborhood through tours, parties, news articles, books, and designation of historic areas (Black, Borut, and Dubinsky, 1977; A Study of Property Taxes and Urban Blight, 1973).

The Developers: Another interest group with "high-stakes" involvement in neighborhood rehabilitation is the developer/real estate professional interest. Although much rehabilitation has been carried out at the instigation of buyers who wish to live in the property themselves, there has been substantial involvement by developers. For example, a developer in Providence, Rhode Island, bought sixteen buildings and renovated them as single family homes, thus stimulating the revival of the College Hill area (A Study of Property Taxes and Urban Blight, 1973, p. 128).
In Columbus, Ohio, one homeowner gradually bought the twenty-seven houses on the block of his boyhood home just north of The Ohio State University campus—"the centerpiece of what must rank as one of the finest one-man neighborhood restoration projects in America" (Fennesy, 1977). His plan was to protect his own environment by exerting control: "I have developed the theory that if you want a decent neighborhood then the only thing to do is own the whole thing" (Fennesy, 1977).

In San Francisco, real estate professionals were one of four identifiable groups buying and renovating homes. In this case realtors were active in the purchase of multi-family housing—buying and renovating, then selling or holding as an investment (Black, Borut, and Dubinsky, 1977, p. 28). That this type of involvement has had repercussions for the interest group process is also apparent. In the Mt. Adams neighborhood of Cincinnati a realty company has been especially active in rehabilitation. Moreover,

(an) important factor in the redevelopment of the area has been the involvement and community focused activities of the area's various speculators, particularly that of one of the owners of the realty company which first invested in the area. This individual formed a neighborhood civic association, organized and led zoning fights to improve rehabilitation opportunities, headed the school improvement committee, and publicized the area's rehabilitation efforts (U.S. Department of Housing and Urban Development, 1977, p. 233).
Having a similar interest as developers are owners of retail establishments—bars, restaurants, curio shops—which stand to gain from the emergence of the neighborhood as quaint, picturesque, and/or deserving of tourist attention. Unlike developers, however, they do not share a complete spectrum of interests with the gentrifying population itself. Retail development is frequently a source of parking problems, especially given the typical paucity of off-street parking for residential use, late-night noise and general congestion. Conflicts over the expansion of retail establishments in gentrifying neighborhoods have consequently been common (Berry, 1978, p. 271).

The Long-Term Residents: While gentrifiers and developers view gentrification as beneficial and combine to further it, long-term residents of the areas are likely to see rehabilitation as a threat. For long-term residents middle class rehabilitation means:

new competition for their homes and neighborhoods. With limited resources in tight housing markets, the long-term residents of older neighborhoods can seldom win in this competition (James, 1977, p. 139).

Renters cannot afford increased rents, and homeowners may be forced out by higher housing costs, particularly property taxes. Just as gentrifiers and developers tend to organize and lobby so as to stimulate the process, therefore, so one can expect the impacted to organize in an
attempt to counter it by, for example, opposing the designation of historic areas.

An example of conflict has been provided by Cybriwsky (1978) in a study of a Philadelphia neighborhood. Fairmount is an inner-city, working class neighborhood of about one-fifth of a square mile. Fairmount is populated by several ethnic groups, and housing transactions and marriages are most often between members of a particular ethnic group. The median income in the area is slightly lower than in Philadelphia. The housing stock is in good condition and residents continue to maintain their properties. Most (almost three-fourths) of the housing is owner occupied, and another fifteen percent is owned by local landlords.

During the 1970's young middle class childless couples and single adults were attracted to the area along the southern border adjacent to a middle and upper income district. The young professionals liked Fairmount because of its location (convenient to downtown) and the relatively inexpensive cost of housing. These newcomers comprised fifteen to twenty percent of the neighborhood population.

In contrast with original Fairmounters, these residents were politically liberal, indoors-oriented, and had social contacts throughout the metropolitan area. Their place of socializing was not the front stoop or the corner; they
only came out to walk their dogs. The housing of the newcomers also stood in contrast with that of Fairmount natives. The dwellings were renovated inside and out in a "colonial Philadelphia" motif or contemporary style.

Conflict between long-term residents and the newcomers ensued. The conflict—expressed mainly by young males with such actions as slashing tires, breaking down newly planted trees, or urinating on front stoops of newcomers—can be described as random and unorganized rather than as issue-oriented and between organized interest groups. According to Cybriwsky, problems in the area are related to the loss of a feeling of neighborhood: this loss is evidenced by the need for police involvement in solving problems whereas problems were solved internally before the newcomers moved into the area.

The Role of the State

Governments, particularly local governments, therefore have been the focus of highly conflicting demands from a variety of pressure groups. Local governments, however, have their own set of particular interests in the gentrification process. For at least three decades, and dating back to the first federal urban renewal legislation in the late 1940s, federal, state, and local governments have been attempting to revive, by a variety of policy initiatives, the central city. They could not, therefore, be anything but in favor of middle class rehabilitation.
For local governments a major attraction is the possibility of an enhanced tax base. The suburbanization of the middle class and of business and their replacement by a relatively dependent population has, over the last thirty years, tended to further the so-called fiscal crisis of the central city. The return of the middle class to the central city offers a possibility of countering this trend.

For example, in Philadelphia,

the downtown area now contributes more in property taxes than it did several years back. Of the $900 million increase in the value of Philadelphia's taxable property between 1970 and 1976, forty-three percent is credited to the central area (Cybriwsky, 1978, p. 5).

Consequently local governments may be expected to enact policies to stimulate investor confidence in an area. Local government agencies may be actively involved in the designation of an area as an historic district. The city planning commission in Dallas, for example, assisted a local community group in having their neighborhood listed as an historic district and formed committees to guide the planning of land use in the area (Black, Borut, and Dubinsky, 1977, p. 23). In Columbus, the German Village rehabilitation was initiated with private money, but there was "public help in (the) initial recognition as (an) historical . . . (area) and in the establishment of the architectural controls which help to maintain the historic character of the housing" (Berry, 1979, p. 69). The public
impetus for reinvestment in Victorian Village in Columbus is more clear: units beyond repair were cleared through urban renewal, street resurfacing and lighting were provided, and funds for maintenance and rehabilitation were made available (Berry, 1979).

Financing has also been a part of government effort to aid middle class rehabilitation. Loans and grants are available for housing in Urban Renewal or deteriorated areas (O'Loughlin and Munski, 1979), and Section 203B guaranteed loans may be used by non-profit corporations to secure financing (Black, Borut, and Dubinsky, 1977). In addition, some cities have exempted from tax the interest on loans made by local banks at below market interest rates to reinvestors (Black, Borut, and Dubinsky, 1977).

Another effort at facilitating financing is local use of federal programs to improve financing in neighborhoods which may be deteriorating but which are basically sound and have a high proportion of ownership (Black, Borut, and Dubinsky, 1977). The program, known as Neighborhood Housing Services, requires active participation by neighborhood groups; local government activity in the form of public improvements and code inspections; cooperation of lenders, i.e., willingness to extend mortgage loans at market rate as well as high risk loans and to make tax deductible contributions to the operation of the program; and the forma-
tion of a group to provide information on rehabilitation and financing (Black, Borut, and Dubinsky, 1977).

In addition, local governments may invest in gentrifying areas by making public improvements and overseeing zoning changes. Improvements such as sidewalks, lighting, street maintenance and traffic management, and parks may be provided. For example, the city of Atlanta provided improvements and support for financing the renovation of twenty-two Victorian houses in one area. City government may also have active code enforcement programs using door-to-door inspections to find building code violations. Code enforcement may be combined with grants or programs such as urban homesteading to ease the problems of abandonment and to introduce middle income households into the neighborhoods (Westmoreland, 1977, p. 100).

Federal and state governments have also shown an interest in gentrification, if only as a means of reducing the need to subsidize central city local governments. Local governments, consequently, have made use of a number of federal policies, including Community Development Block Grants and urban homesteading as a means of furthering middle class rehabilitation. However, not all policy effects with positive implications for gentrification have been intended. Gentrification has also been the beneficiary of certain inadvertent effects of local tax policy. As Peter-
son, et al., (A Study of Property Taxes and Urban Blight, 1973) have shown, assessed property values may lag substantially behind market values. Where property values in some neighborhoods are increasing, as in gentrified neighborhoods, assessment lag can be characterized as a subsidy to public services in that neighborhood from areas where property values are declining.

To summarize the positivistic perspective on gentrification, the process is seen as produced by the interaction of independent "factors". Specifically, the driving force behind gentrification appears to be demand for old, architecturally interesting housing proximate to the CBD by young, professional singles or two-earner households. The extent and direction of gentrification are seen as guided by the interactions of interest groups each with their own inherent characteristics and interests.

Explanation for why gentrification occurs is limited, however, and the few attempts at explanation emphasize demand as the driving force behind gentrification. Little or no attention is paid to supply, and, hence, creation of demand. Thus, demand is seen as independent, and not related to the needs of capital for profitable investment. For example, how important is investment by real estate professionals versus resident owners, what role is played by real estate professionals in creating an ambience...
enhancing to gentrification, and what temporal patterns can be observed with respect to investor type and amounts invested? Answers to these questions would provide greater understanding of the gentrification process.

Another aspect of gentrification neglected in the literature is the selection out of neighborhoods for middle class rehabilitation, i.e., why is there investment in some neighborhoods but not others? The literature only describes gentrification as occurring in areas proximate to the CBD, in neighborhoods with distinctive architecture, and in neighborhoods with certain population characteristics (e.g., older, ethnic, low-income, transient) (Clay, 1983). However, there may be many locations within the inner city with these characteristics, yet gentrification does not occur in all of them. Thus the question of selection of particular neighborhoods requires further investigation.

A final question of process is the link between downtown office employment and gentrification. The observed increase in white collar employment in the CBD is taken as an exogenous factor that influences demand for inner-city housing. There is no attempt to explain a relation between employment shifts (in terms of both location and nature of employment) and inner-city residential rehabilitation.
Alternative Explanations of Gentrification

Explanation of gentrification, therefore, has tended to rely upon neo-classical models based on the interplay of independent "factors". The point at which this conception falls short is the implication that factors are indeed independent, rather than born out of social relationships, i.e., socially created.

For example, in a positivistic explanation, much emphasis is placed on demand for older housing, yet no attempt is made to explain the demand. Specifically, there is no recognition given to a link between the development of inner-city areas (beginning with urban renewal efforts) and subsequent growth in the attractiveness of residential investment in the inner city. Further, much is made of employment location and the desire to live near employment, but the relationship between CBD office development, growth of administrative functions, and changes in residential patterns is not made. Explanation for gentrification must also take into account the role of producers and their need for profitable investments, i.e., the question of the shaping of consumer demand must be addressed.
Structural Tendencies Creating the Possibility of Gentrification

A marxist view of the gentrification process takes into account societal trends and tendencies which make the fact of gentrification possible and those trends which affect the form taken by gentrification. Gentrification is seen in relation to a total restructuring of urban form. Although comparatively little has been written about gentrification from a marxist perspective, contributions to the view of the interrelationships of processes responsible for this reshaping of urban form have been made by Smith (1979, 1979, 1982, 1983) and Rose (1984). From a marxist perspective, the recent changes in urban form, specifically increased CBD office employment and development of white collar residential areas can be linked to investment by capital and the internal contradictions that grow out of capital's efforts toward expansion.

Gentrification, then, is seen as "a back to the city movement by capital, not people" (Smith, 1979). In other words, explanation for gentrification must include the role of producers, and from a marxist viewpoint, "... the needs of production—in particular the need to earn a profit"—plays the decisive role in the initiation of gentrification (Smith, 1979, p. 540).
Gentrification and the rent gap: According to Smith (1979, 1983), one of the necessary preconditions for gentrification and investment in the urban core is the creation of the "rent gap". At the urban scale, the rent gap is created when capital moves away from the central city to suburban locations seeking lower ground rent and, hence, higher rates of profit. As capital moves out, ground rent levels in the city fall, resulting in

a rent gap in the inner city between the actual ground rent capitalized from the present (depressed) land use and the potential rent that could be capitalized from a "higher and better" use (Smith, 1983, p. 14).

When the rent gap becomes large enough that reinvestment in a higher and better use permits acceptable rates of profit, then the opportunity for reinvestment exists:


gentrification occurs when the gap is wide enough that developers can purchase shells cheaply, can pay the builders costs and profit for rehabilitation, can pay interest on mortgage and construction loans, and can then sell the end product for a sale price that leaves a satisfactory return to the developer (Smith, 1979, p. 545).

On the other hand, the rent gap by itself is not sufficient for explaining gentrification. Other conditions are also necessary.

Changes in central city employment: Residential investment in the central city has also been linked to the expansion of office employment in the central city, particularly of that in the higher paid professional grades: law,
accounting, consultation of all types, stockbroking, higher education and management. Bearing in mind the recent and rapid emergence of office employment in the American central city, this seems a valid point. Existing data, however, do not provide as precise a documentation of this change as would be desirable. Nevertheless, statistics from planning departments in six U.S. cities indicates a sharp increase in office floor space over the period 1960-1972 (Manners, 1974, p. 94). In Manhattan, with the largest office complex in the country, office floor space expanded by seventy-four percent; in downtown Chicago, the figure was fifty percent. Other figures were sixty percent for Boston, sixty percent for Dallas, seventy-nine percent for San Francisco, and eighty-two percent for Atlanta.

Office expansion can be attributed to a diversity of forces. These include on the one hand the growing significance of financial institutions in the economy as a whole, of state and local government, and the growing importance of sales and market research in the modern industrial corporation. These changes (i.e., deindustrialization, growth of office employment) reflect changes in the total national economy but were physically manifested in urban centers. Smith interprets these changes as helping to explain "the kinds of building stock and land use most involved in the development of the rent gap, and second, the kinds of new
land uses which can be expected where the opportunity for redevelopment is taken" (Smith, 1983, p. 6).

The question remains as to why white collar employment is centralized in the central city. At a time when routine office functions (facilitated by communication and transportation technology) have been decentralized, why have corporate headquarters—the locus of decision-making—remain centralized? This may be explained by the need for short-term response to problems confronting the corporate structure, e.g., packaging of deals, changes in interest rates, action by a competitor. Response often requires assembly of a team of experts (attorneys, accountants, financial managers, advertising advisors, e.g.) for face-to-face discussions and negotiation. Hence, Smith explained the corporate/professional character of employment observed in the restructured urban core.

Investment by capital in the built environment of the central city was also given an assist from urban renewal projects during the 1950's and 1960's (Smith, 1983, p. 25): the function of this urban renewal was to prepare the way for the future restructuring which would emerge in the 60's and become very visible in the 70's. In economic terms the state absorbed the early risks associated with gentrification, as in Philadelphia's Society Hill . . . which was itself an urban renewal project. It also demonstrated to private capital the possibility of large scale restructuring of the urban core, paving the way for future capital investment.
Demographic Changes and Consumption Patterns: The spatial concentration of white collar workers is presupposed by growth in professional, managerial, and technical occupations and the concentration of those occupations in central areas of large cities. Although the fact of this concentration has implications for the type of development observed in inner-city neighborhoods, e.g., trendy boutiques and gourmet food shops (Smith, 1983, p. 27), the question remains as to why these groups are attracted to inner-city residences. In other words, how are gentrifiers (middle class inner-city dwellers) produced?

Rose views the production of gentrifiers as bound up in the social and spatial restructuring of labor processes and changes in household and family structure. Restructuring of both social and spatial aspects of labor processes have been realized in the urban transformation. There has been a widening of the division of labor in white collar occupations, with women filling many of the niches created in the increased division of labor. Further, the increased participation by women in the work force is part of the restructuring of households and families (e.g., increased number of female heads of household, fewer children, postponement of childbearing).

According to Rose, the needs and desires of these different factions of labor should be addressed in order to
better understand the production of gentrifiers. She observed that female heads of households and other non-traditional household types may play an important role in the early stages of gentrification. For example, household types associated with the early stages of gentrification may be seeking access to services, efficiency, non-isolation. If the conventional suburban locations are found to be hostile to their needs, then "the needs and desires of these groups in conjunction with other contingent factors may become more important in producing gentrification" (Rose, 1984, p. 56). Thus Rose concluded that analysis of production of gentrifiers may produce not one gentrification process but several successive processes of neighborhood change.

To summarize, the emphasis in a marxist view of gentrification is on the role of producers in creating a demand for older, inner city housing. In contrast to work from a positivistic view, explanation from a marxist perspective discounts the ideas of preferences as the motor of gentrification and of preferences being intrinsic to individuals. The marxist argument—built around the concepts of a rent gap, capital's need for profitable investment, employment shifts, and changes in demographic and consumption patterns—is that demand for inner city housing has been created by producers (operating in a context of a set of interrelated pre-conditions) not consumers.
SUMMARY

Conceptions of the gentrification process from a positivistic view typically dwell upon three interrelated factors seen as independent entities: consumer preference, interest group processes, and the state. In terms of consumer preference, for instance, much has been made of changing demands for housing. It is argued, for example, that there has been a sharply enhanced evaluation of the architecturally distinctive yet structurally old residential property. With respect to interest group processes, discussion usually focuses upon the interactions and contestations of the gentrifiers themselves, the displaced, and the developers. By its actions, local government has also revealed an interest in promoting the gentrification process, presumably for fiscal reasons.

In contrast to the positivistic view, marxist work on gentrification has focused on the social relations producing changes in urban structure observed since World War II. Gentrification, seen as one part of this shift in capital investment, is tied to shifts in property values, an increase in and spatial concentration of the professional/managerial/technical workforce in the central city and demographic changes.
RESEARCH QUESTIONS

Questions not yet completely answered by either approach to the study of gentrification are as follows:

1. **spatial pattern:** What is the spatial pattern of rehabilitation at the neighborhood level? Are gentrified neighborhoods different from other inner-city neighborhoods? How evident is the phenomenon at different scales?

2. **investor types:** Are there differences in investors with respect to occupation, timing and amount of investment, and motive for investment?

3. **location of gentrification:** Why is there investment in particular inner-city neighborhoods rather than others?

4. **association with the "post-industrial" city:** Is there a link between social and economic changes in the city as a whole and gentrification?

With respect to an association with urban transformation (the "post-industrial" city) thus far we have no empirical evidence establishing this link. The object in this case is to provide some indication of residential change reflective of occupational change in the central city.

Spatial pattern will also be examined. First, the effect of increase of white collar employment on metropolitan area residential patterns will be examined. Second,
spatial concentration of white collar residents in the inner city will be tested. And, thirdly, pattern within a neighborhood will be analyzed. Analysis at these three scales will provide more insight as to the significance of gentrification for: changes in metropolitan area residential patterns; the specificity of location within the inner city; and for the similarity of diffusion of rehabilitation to spatial patterns exhibited by other geographic phenomena.

Analysis of process at the neighborhood level, i.e., differences in investor types, tests the image of investment as mainly by residents and also offers some insights into investor motives. Finally, the study of neighborhood selection addresses a large gap in knowledge about the location of gentrification.

These topics are explored in this dissertation in an effort to fill in gaps in existing work on gentrification. Chapter III focuses on the spatial pattern of gentrification at different scales. A thirty-year time period will be used to measure the emergence and spread of gentrification. Analyses will be made at the levels of the urban area, the inner city, and the neighborhood. A methodology used to measure extent and pattern of gentrification at the neighborhood level is presented.
Analysis of why gentrification occurs is the theme of Chapter IV. An explanation of location of gentrification is offered, difference in investment activity within a gentrified neighborhood is analyzed, and the link between downtown office development office employment and workplace of gentrifiers is explored.
Chapter III

SPATIAL AND TEMPORAL PATTERNS OF GENTRIFICATION

One evaluation of the significance of the gentrification phenomenon is analysis of its effect at different geographic scales. Thus the question to be addressed in this chapter is the effect of the gentrification phenomenon at different scales within the urban center. Spatial and temporal patterns of gentrification at three scales will be examined:

* city/suburb contrasts;
* differentiation within the inner city;
* patterns of change within areas identified as gentrified.

At the scale of the metropolitan area as a whole, changes in the residential distribution of white collar workers over the period 1950-1980 will be examined. This analysis addresses the question of increased middle class, i.e., white collar, occupancy in central city areas and specifies the nature of change in middle class residential patterns. For example, has there been an absolute increase in middle class residents in the inner city, or is the increase only
relative to changes elsewhere in the urban area or within other segments of the population?

Metropolitan area analysis provides a general indication of change in residential patterns. A more specific picture of change is given by analysis at the level of the inner city. Identification of differences (or similarities) in neighborhoods within the inner city may shed light on questions concerning the gentrification process and the specific location of gentrified neighborhoods. A third level of analysis is the gentrified neighborhood itself. Spatial and temporal patterns of property rehabilitation are tested for evidence of contagion effects. Results of this investigation may provide additional clues concerning the gentrification process.

THE RETURN OF THE MIDDLE CLASS TO THE INNER CITY: CITY/SUBURB CONTRASTS

The widespread attention given to instances of gentrification in American cities has encouraged the development of an image in the media which looks forward to a wholesale return of the middle class to the inner city. The social science literature, however, suggests that, on the contrary, gentrification is associated more with immigration of middle class households from elsewhere within the central city than with inmovers from the suburbs (Smith, 1979; Sag-
gar, Varady, and Tuchfarber, 1980; Laska and Spain, 1980), though clearly this implies some rigorous differentiation between central city and suburb which, in practice, is difficult to sustain.

At any rate, it seems immaterial as to whether an increase in middle class residents in the inner city (if indeed this is the case) results from either relocation or newly formed middle class households choosing to remain in the central city: both acts, after all, imply a choice between locations; i.e., between "closer in" locations on the one hand, and "further out" locations on the other.

A second problem associated with evaluation of the return of the middle class to the inner city is that neither the central city nor the suburbs are discrete areas. Methodology, therefore, must reflect locational decisions made with respect to a central city-suburb continuum rather than with respect to mutually exclusive geographical categories.

Third, a return to the inner city could be either absolute or relative in character. In absolute terms the increase would be in actual numbers of middle class individuals in inner city locations would be increasing as signified by increasing densities. In relative terms, however, the middle class return to the central city could be a shift in the composition of the inner-city population
with more middle class individuals relative to lower class individuals. This could occur irrespective of whether or not there was an actual increase in middle class densities.

Fourth, increasing middle class densities in the inner city could be merely relative to changes in the suburbs; i.e., middle class densities could be decreasing throughout the city as a result of, e.g., population decline, but the fall in middle class densities would be greater at the edge of the city than at the center. Hence, there is the possibility of a relative increase in middle class densities in the inner city rather than an absolute increase. Likewise with respect to increases in the middle-class population of the inner city: the increase could be absolute in the sense that the middle class/lower class population ratio in the inner city actually experiences an increase; or it could be relative, with a decline in the ratio throughout the city but much more at the edge of the city than in the center.

One way to give attention to the continuum character of the central city-suburb distinction is by examining changes in the distribution of the middle class, either considered on its own or as a ratio to the lower class, as a function of distance from the central business district. In the case of the middle class taken on its own (the pure case), a population density model can be used:
(1)

\[ P_i = ae^{-bD_i} \]

where \( P \) = middle class population per square mile in the \( i \)th census tract
\( D \) = distance of the \( i \)th census tract from the CBD
\( e \) = natural logarithmic base
\( b \) = density gradient

Linearized, the equation becomes:

(2)

\[ \ln P_i = \ln a - bD_i + e_i \]

where \( e \) = the error term.

The dependent variable is the density of middle class individuals in the \( i \)th census tract. Fitting the equation to data for successive points in time would produce a set of intercepts and density gradients permitting evaluation of the "return to the inner city" hypothesis.

To the extent that the intercept increases over time and the slope becomes more negative, then middle class densities towards the inner city can be said to have increased in the absolute sense (see Figure 6). On the other hand, if the intercept declines while the slope becomes more negative, then the increase is relative rather than absolute.
Increase in Middle Class Densities in the Central City (Pure Case)

Increase in Middle Class Relative to Lower Class in the Central City (Ratio Case)

$Y_1 = \ln \text{ Middle Class Density}$

$Y_2 = \text{ Middle Class/Lower Class}$

$D = \text{ Distance from the CBD}$

**Figure 6:** Four Types of Middle Class Return to the Inner City
In the case of the middle class relative to the lower class (the ratio case), the relationship between a proportion and distance from the CBD is examined:

\[ \%MC_i = a + bD_i + e_i \]

where \( \%MC \) = \% of the population which is middle class

If there is an increase in intercept and a decrease in slope, an absolute increase in the ratio of middle class to lower class in inner city locations is indicated. On the other hand, a decrease in the intercept as well as the slope will indicate a relative rather than absolute increase in the middle class inner-city ratio (see Figure 6).

To evaluate the return-to-the-inner-city hypothesis, data from the U.S. Census of Population and Housing for the city of Columbus, Ohio, for 1950, 1960, 1970, and 1980 were used. Four time periods were included in order to evaluate change over a longer time period than is generally included in discussions of "urban renaissance." The selection of the initial census year, 1950, was based on availability of comparable data over the four time periods. Data were collected for all tracts within the city and in contiguous incorporated areas. Tracts with predominantly institution-
alized populations and tracts with very low middle class population densities (logarithm of density less than 3) were eliminated from the sample. Problems with missing data and atypical population groups were avoided by eliminating these tracts.

One index of middle-class status was used: occupational status as indicated by white collar/blue collar status. White collar occupations were defined as managerial and professional specialty occupations and technicians and related support occupations. Urban-scale measures used by other researchers are race (Spain, 1980) and homeownership and home repair rates (James, 1980). Variables such as educational level, income, household size, and occupational status tend to be used more in research at the neighborhood level. However, occupational status was selected for this study because this characteristic has been shown to be strongly related to residential location. Duncan and Duncan (1955) found the most residential segregation among both the highest and lowest status occupational groups. Perhaps a more important reason for choosing occupational status as a measure of change in city structure is to test any relation between gentrification and change in employment structure in central cities.

In addition to the distance from the CBD, two other independent variables have been inserted in the regression
equations: median income and percent of the population which is black. The black population variable is necessary given the atypicality of blacks with respect to intraurban location decisions, and the use by whites of racial criteria in their locational decisions, precluding any middle class return to inner city areas of black residence. Median income was included as a control variable because there is not a one-to-one relationship between it and measures of social status. Without control for income, validation of a return of the middle class to the inner city could be challenged with the suggestion that the return is predominantly among lower income members of the middle class.

Initial experimentation with the regression equations revealed convexities in the functions. Thus, the application of a linear function produced substantially lower R-square values. Hence, a distance-squared term was included in the equation to provide a better fit to the convex form of the function. The resulting model for the pure case is as follows:

\[
\text{LnMC}_i = \ln a + b_1 D_i + b_2 D_i^2 + b_3 MI_i + b_4 %B_i + e
\]

where \( \text{LnMC} \) = natural log of the density of the population which is middle class in the \( i \)th census tract

\( D \) = straight line distance from the center of the CBD to center of tract
MI = median income
%B = percent black

Similarly, the model for the ratio case is:

(5)

\[ \%MC_i = a + b_1 D_i + b_2 D_i + b_3 MI_i + b_4 %B_i + e_i \]

where \( \%MC \) = percent of the population which is middle class in the \( i \)th census tract

\( D \) = straight line distance from the center of the CBD to center of tract

\( MI \) = median income

\( %B \) = percent black

---

The Middle Class Return to the Inner City: The Pure

In evaluating the pure case, the natural logs of middle class densities(4) were regressed on distance plus the square of the distance from the CBD (see Table 3 and Figure 7).

Middle class densities declined throughout the city and suburbs between 1950 and 1960 at almost the same rate. The decline in inner city white collar density parallels the expected model of inner city decline. In 1970, density of white collar workers in the inner city increased dramati-

---

(4) Middle class density is the number of white collar workers per square mile in each census tract. Census tract areas for most tracts were obtained from the Columbus Department of Development; areas for remaining tracts were calculated using a planimeter.
<table>
<thead>
<tr>
<th>Year</th>
<th>Equation</th>
<th>( R^2 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>( WC_i = 6.66 - 0.12D_i - 0.003D_i^2 + 0.00008MI_i - 0.71%B_i + e_i )</td>
<td>0.105</td>
</tr>
<tr>
<td>1960</td>
<td>( WC_i = 6.43 - 0.08D_i - 0.01D_i^2 + 0.00007MI_i - 1.3%B_i + e_i )</td>
<td>0.122</td>
</tr>
<tr>
<td>1970</td>
<td>( WC_i = 6.24 - 0.44D_i + 0.003D_i^2 + 0.0002MI_i - 1.4%B_i + e_i )</td>
<td>0.286</td>
</tr>
<tr>
<td>1980</td>
<td>( WC_i = 6.95 - 0.07D_i + 0.001D_i^2 + 0.00003MI_i - 1.4%B_i + e_i )</td>
<td>0.620</td>
</tr>
</tbody>
</table>

WC = logarithm of the density of white collar workers in the ith census tract; \( D \) = the distance from the CBD to the center of the ith census tract; \( D^2 \) = the square of distance; \( MI \) = median household income in the ith census tract; \( \%B \) = percent black population in the ith census tract; t-values in parentheses.
cally, thus demonstrating a turnaround consistent with increase in white collar workers and indicating a reversal in inner city decline. In areas further from the city center, however, density of white collar workers declined. This pattern can be attributed to the inclusion of new 1970 census tracts with low population densities. The pattern in 1980 is quite different from earlier years, with density being quite high throughout the central city and more distant areas. This can perhaps be attributed to the growth in white collar occupations and the dispersion of these jobs throughout the urban center. The peak in white collar density at a point just over one mile from city center may be indicative of the increase in white collar residents in gentrified neighborhoods.
Figure 7: Middle Class Densities and Distance from the CBD. Columbus, Ohio, 1950, 1960, 1970, 1980
The Middle Class Return to the Inner City: The Ratio

In evaluating the ratio case, white collar workers as a percent of the total occupied population was employed as a measure of middle classness or status composition. Population compositions towards the inner city are increasingly middle class throughout the four-decade period. The regression equations are presented in Table 4; the coefficients of multiple determination range from 25.6 to 59.8 percent, considerably higher than for the previous analysis. The relationships are illustrated in Figure 8; each year is represented by a regression line whose position has been calculated by holding percent black and median income at the mean values. The graphs show that the rate of middle class growth in the inner city was approximately the same as on the suburban edge of the city between 1950 and 1960. Growth of middle class population in the inner city was greatest between 1960 and 1970, and middle class population at the periphery declined both in 1970 and 1980.

Analysis of middle class residential patterns in the Columbus metropolitan area indicated increased middle class occupancy in the inner city throughout the three-decade period. Further, increases occurred in an absolute sense, with the percentage of white collar workers in the inner city being greater in each successive period. The pattern for change in middle class density, however, is not as
Table 4
Occupational Composition and Distance from the CBD, Columbus, Ohio, 1950, 1960, 1970, 1980

1) 1950 (N=71):
\[
\%WC_i = -0.04 + 0.02D_i + 0.00006MI_i - 0.01\%B_i + e_i
\]
\[
(3.15) \quad (7.14) \quad (0.19)
\]
\[
R^2 = .598
\]

2) 1960 (N=119):
\[
\%WC_i = 0.03 + 0.008D_i + 0.00004MI_i - 0.09\%B_i + e_i
\]
\[
(1.12) \quad (6.65) \quad (1.78)
\]
\[
R^2 = .492
\]

3) 1970 (N=181):
\[
\%WC_i = 0.10 + 0.006D_i + 0.00002MI_i - 0.06\%B_i + e_i
\]
\[
(0.99) \quad (5.75) \quad (1.32)
\]
\[
R^2 = .256
\]

4) 1980 (N=243):
\[
\%WC_i = 0.15 - 0.002D_i + 0.00001MI_i - 0.14\%B_i + e_i
\]
\[
(1.70) \quad (8.65) \quad (4.30)
\]
\[
R^2 = .389
\]

\%WC = percent white collar workers in the ith census tract; 
D = distance from CBD to center of the ith census tract; 
MI = median household income in the ith census tract; 
\%B = percent black population in the ith census tract; 
t-values in parentheses
clear. The density of middle class occupants within two miles of the CBD decreased between 1950 and 1960 but increased after 1960. Thus a general pattern of increased middle class occupancy in the inner city is revealed by census tract data.
Another measure of gentrification is change within the inner city area. Have gentrified neighborhoods changed in ways different from non-gentrified neighborhoods? For example, differences may be evident with respect to property values and homeownership rates. Property values in gentrified neighborhoods would be expected to increase more than in other areas of the inner city. Likewise, if middle class residents are the primary investment group, then higher rates of homeownership would be expected in gentrified neighborhoods.

To arrive at an understanding of inter-neighborhood differences, three types of analyses were performed. First, spatial differentiation of changes in ownership rates and property values was examined. In addition, a regression analysis was performed to test the strength of the relationship between increased property values and location in a gentrified neighborhood. Thirdly, a factor analysis of sixteen variables for eighteen inner-city neighborhoods demonstrated contrasts between gentrified and non-gentrified neighborhoods.
Differences in Property Values and Homeownership

For the analysis of homeownership rates and property values, three sets of blocks or block-groups within one-and-one-half miles of the CBD were proportionately and randomly selected: fifteen blocks from the three German Village tracts (seven blocks or block-groups from Tract 52; seven, from Tract 57; and one, from Tract 58.1); fifteen blocks or block-groups from the four Victorian Village Census tracts (two blocks or block-groups from Tract 18.2; seven, from Tract 20; five, from Tract 21; and one, from Tract 32); and fifteen blocks or block-groups from the fourteen other tracts within one-and-one-half miles from the CBD. The criterion for selection was a threshold of ten households in each block in 1950. This minimum number was established to reduce the problem of data suppression and of loss of housing units over time.

Data on numbers of housing units, numbers of owners, mean values of owner occupied housing, and mean contract rents were collected. Percentage changes in homeownership rates and in property values over the three decades were

(5) In this instance, "block-groups" refer to the aggregation of blocks for the purpose of creating data-collecting units which are comparable over time.

(6) The proportion of blocks chosen in each tract represents the ratio of blocks in that tract in which the block is located to the total blocks in the neighborhood. For example, if there are 50 blocks in the neighborhood and 25 of those blocks lie in one tract then 50.0 percent of the sample would be chosen from that one tract.
then calculated. (7) Summary statistics are presented in Table 5 and Table 6.

Table 5

<table>
<thead>
<tr>
<th>Changes in Homeownership Rates in Randomly Selected Blocks Located Within One-and-one-half Miles of the Columbus, Ohio, CBD, 1950-1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage Change Within Decade</td>
</tr>
<tr>
<td>German Village</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1950-1960</td>
</tr>
<tr>
<td>(n=13)*</td>
</tr>
<tr>
<td>1960-1970</td>
</tr>
<tr>
<td>(n=12)*</td>
</tr>
<tr>
<td>(n=11)*</td>
</tr>
</tbody>
</table>

T-test between means of "gentrified" and "non-gentrified" areas is significant at the .05 level for the decade 1970-1980.

*N's for each decade in the "non-gentrified" areas are less than fifteen because of data suppression.

---

(7) To avoid problems of missing data in blocks with no homeowners and to give a more complete picture of housing values, property values for census blocks were calculated using a combination of mean contract rent and home values. The value was estimated using the sum of the number of units reporting contract rents times the average contract rent and the number of units reporting values of owner-occupied dwellings times 1/100 of the average value of an owner-occupied dwelling (Muth, 1969, p. 188).
Table 6

Changes in Property Values in Randomly Selected Blocks Located Within One-and-one-half Miles of the Columbus, Ohio, CBD, 1950-1980

<table>
<thead>
<tr>
<th>Percentage Change Within Decade</th>
<th>German Village</th>
<th>Victorian Village</th>
<th>&quot;Non-gentrified&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std Dev</td>
<td>Mean</td>
</tr>
<tr>
<td>1950-1960</td>
<td>68.39</td>
<td>31.35</td>
<td>49.80</td>
</tr>
<tr>
<td></td>
<td>(n=14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1960-1970</td>
<td>64.00</td>
<td>32.63</td>
<td>12.20</td>
</tr>
<tr>
<td></td>
<td>(n=13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1970-1980</td>
<td>219.80</td>
<td>89.68</td>
<td>156.60</td>
</tr>
<tr>
<td></td>
<td>(n=10)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

T-test between means of "gentrified" and "non-gentrified" areas is significant at the .05 level for the decade 1970-1980.

*N's for each decade in the "non-gentrified" areas are less than fifteen because of data suppression.

Homeownership rates decreased in all time periods and in all three areas except during 1970-1980 in gentrified areas. This is consistent with reports in the literature, to the effect that resident investors are the main force behind gentrification. On the other hand, homeownership rates decreased in German Village between 1960 and 1970, perhaps indicating that non-resident owners were more active during the early stages of gentrification in that neighborhood. Differences between investor type and in timing of investment will be further investigated in Chapter IV.
The most striking difference in change in homeownership rates is in the 1970-1980 period. Rates declined by 15.6 percent—the largest decline in three decades—in non-gentrified areas of the inner city. In contrast, rates displayed complete turnarounds in gentrified areas. This suggests conversion of rental units to owner occupancy as a concomitant of rehabilitation in the area, though not necessarily as a concomitant of rehabilitation of individual units.

Changes in property values also were used as a measure of difference between gentrified and non-gentrified areas. Property value increases were greatest during the 1970-1980 decade when all real estate enjoyed rapid appreciation. German Village and Victorian Village property increased in value at rates 2.61 and 1.86 times, respectively, the rate for non-gentrified areas. This comparison shows that indeed there were statistically significant differences between property value changes in gentrified and non-gentrified areas during the last of the three decades. In addition, increases in German Village property values, while not significantly different, were greater than in other areas in all three time periods.
Changes in Property Values

Property values were also measured as a function of earlier values and location within and outside a gentrified area. Three regression functions with the logarithm of property values for 1960, 1970, and 1980 as the dependent variable and for blocks in gentrified and non-gentrified neighborhoods were calculated. Independent variables were property values in the earlier decade and dummy variables for location in gentrified neighborhoods. The regression equations are shown in Table 7.

The results confirm greater increases in property values—as a function of values a decade earlier—in German Village in 1960 and 1970. The slope of the regression line is greater in German Village than in the other two areas in 1960 and 1970 (see Table 8). Increases in Victorian Village, however, were less than in non-gentrified areas between 1960-1970 but greater during 1950-1960 and 1970-1980. This pattern corresponds with the take-off point for Victorian Village (around 1973). In non-gentrified areas, the slope decreased in 1970 and again in 1980.

Another observation concerning property value change is the increase in coefficient of determination over time, i.e., 13.1 in 1960, 61.7 in 1970, and 75.2 in 1980. This would seem to indicate increasing strength in the association between current property values and earlier values.
Table 7

Property Values for Census Blocks As A Function of Earlier Values and Location in A Gentrified Area, Columbus, Ohio, 1960-1980

1) 1960 Property Values (N=43):

\[
\ln(PV_{60i}) = 8.49 + 0.00007PV_{50i} + 0.00011GVPV_{50i} - 0.000007VVPV_{50i} - 0.429GV_i + 0.04VV_i + e_i
\]

\[R^2 = .131\]

2) 1970 Property Values (N=42):

\[
\ln(PV_{70i}) = 8.71 + 0.00003PV_{60i} + 0.00002GVPV_{60i} - 0.00002VVPV_{60i} + 0.23GV_i + 0.07VV_i + e_i
\]

\[R^2 = .617\]

3) 1980 Property Values (N=39):

\[
\ln(PV_{80i}) = 9.41 + 0.00004PV_{70i} + 0.00009GVPV_{70i} + 0.0002VVPV_{70i} - 0.16GV_i - 0.85VV_i + e_i
\]

\[R^2 = .752\]

LnPV = logarithm of average property value in the ith census block; GVPV = average property value in the ith census block in German Village; VVPV = average property value in the ith census block in Victorian Village; GV = 1, if located in German Village and 0, if not; VV = 1, if located in Victorian Village and 0, if not; t-values in parentheses
Table 8

Differences in Slope and Intercept for Gentrified and Non-Gentrified Areas: Property Values as a Function of Earlier Values and Location

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Slope</th>
<th>Intercept</th>
<th>Slope</th>
<th>Intercept</th>
<th>Slope</th>
<th>Intercept</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>1970</td>
<td>1980</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neighborgood Areas</td>
<td>0.00007</td>
<td>8.49</td>
<td>0.00003</td>
<td>8.71</td>
<td>0.00002</td>
<td>9.41</td>
</tr>
<tr>
<td>German Village</td>
<td>0.00018</td>
<td>8.07</td>
<td>0.00005</td>
<td>8.94</td>
<td>0.00011</td>
<td>9.25</td>
</tr>
<tr>
<td>Victorian Village</td>
<td>0.00008</td>
<td>8.45</td>
<td>0.00001</td>
<td>8.78</td>
<td>0.00022</td>
<td>8.56</td>
</tr>
</tbody>
</table>

A Factor Analysis of Inner-City Neighborhoods

Changes in property values and homeownership rates indicate differences between gentrified and non-gentrified areas. This contrast was magnified when a set of neighborhood characteristics for eighteen inner-city neighborhoods was analyzed. Sixteen variables (listed in Table 9) were selected with reference to important differences identified in the literature between gentrified and non-gentrified inner-city neighborhoods. Data (1980) on these characteristics for eighteen neighborhoods (8) within two miles of the CBD (9) (see Figure 9) were collected and a factor analysis performed.

---

(8) The source for the neighborhood data was the Neighborhood Statistics Program, 1980 Census of Population and Housing, Ohio, pt. 37, U.S. Department of Commerce, 1983.

(9) The two-mile radius was used in order to include Harrison West, a neighborhood identified as "gentrifying."
<table>
<thead>
<tr>
<th>Variable</th>
<th>Loadings Factor 1</th>
<th>Loadings Factor 2</th>
<th>Loadings Factor 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Two or more workers/family</td>
<td>0.7692</td>
<td>-0.1726</td>
<td>0.4156</td>
</tr>
<tr>
<td>Per capita income</td>
<td>0.9080</td>
<td>0.2575</td>
<td>0.1772</td>
</tr>
<tr>
<td>Percent White collar</td>
<td>0.9368</td>
<td>0.2731</td>
<td>0.0254</td>
</tr>
<tr>
<td>Percent female in labor force</td>
<td>0.6966</td>
<td>0.3407</td>
<td>0.5765</td>
</tr>
<tr>
<td>Average housing value</td>
<td>0.7799</td>
<td>0.2611</td>
<td>0.2627</td>
</tr>
<tr>
<td>Percent Age 30-44</td>
<td>0.9110</td>
<td>0.0145</td>
<td>0.3083</td>
</tr>
<tr>
<td>Percent four or more years college</td>
<td>0.9515</td>
<td>0.1876</td>
<td>0.0217</td>
</tr>
<tr>
<td>Percent widowed</td>
<td>-0.2621</td>
<td>-0.0560</td>
<td>-0.9404</td>
</tr>
<tr>
<td>Percent age 60 and over</td>
<td>-0.2041</td>
<td>0.2161</td>
<td>-0.7791</td>
</tr>
<tr>
<td>Number persons per family</td>
<td>-0.4593</td>
<td>-0.7211</td>
<td>-0.0695</td>
</tr>
<tr>
<td>Percent less than age 20</td>
<td>-0.5687</td>
<td>-0.7714</td>
<td>0.0010</td>
</tr>
<tr>
<td>Percent single</td>
<td>0.1089</td>
<td>0.7215</td>
<td>0.2092</td>
</tr>
<tr>
<td>Percent self-employed</td>
<td>0.4914</td>
<td>0.1864</td>
<td>0.2423</td>
</tr>
<tr>
<td>Percent working at home</td>
<td>0.1379</td>
<td>0.1239</td>
<td>0.1554</td>
</tr>
<tr>
<td>Number one-person households</td>
<td>0.1702</td>
<td>0.8447</td>
<td>-0.4456</td>
</tr>
<tr>
<td>Percent owner occupied housing units</td>
<td>0.2856</td>
<td>-0.5750</td>
<td>0.4833</td>
</tr>
</tbody>
</table>
The first factor explained 57.6 percent of the variation; the factor provided a summary of variables most often
used to describe gentrified areas. Neighborhoods with high positive scores (see Table 9) therefore had large percentages of white collar workers, two or more workers per household, females employed in the labor force, population between the ages of thirty and thirty-four, and individuals with at least four years of college education; higher per capita incomes and housing values were also typical. On the other hand, high-scoring neighborhoods had low percentages of their populations under the age of twenty. The two gentrified neighborhoods, German Village and Victorian Village, scored 3.56 and 1.22, respectively, on this factor (see Table 10).

The only other neighborhood with a positive score on this factor was Southtowne, the area immediately adjacent to German Village. This may indicate some spillover effect from a gentrified neighborhood into a non-gentrified area. On the other hand, the two neighborhoods adjacent to Victorian Village, Harrison West and Italian Village, had negative scores for factor one. The negative scores are surprising because both neighborhoods have been recognized as locations of middle class investment. Investment has been rather recent in both areas, however; thus changes may not be apparent in the 1980 data.

Factor two accounted for 24.1 percent of the variation among neighborhoods (see Table 10). Variables with the
Table 10

Factor Scores of Eighteen Neighborhoods

<table>
<thead>
<tr>
<th>Neighborhood</th>
<th>Factor One</th>
<th>Factor Two</th>
<th>Factor Three</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Franklinton</td>
<td>-0.2764</td>
<td>0.4334</td>
<td>1.3835</td>
</tr>
<tr>
<td>East Franklinton</td>
<td>-0.8465</td>
<td>2.1374</td>
<td>-0.3879</td>
</tr>
<tr>
<td>Garrison Park</td>
<td>-0.2826</td>
<td>-0.1882</td>
<td>-1.0198</td>
</tr>
<tr>
<td>German Village</td>
<td>3.5823</td>
<td>-0.9108</td>
<td>-1.1899</td>
</tr>
<tr>
<td>Harrison West</td>
<td>-0.3265</td>
<td>-0.9797</td>
<td>0.6652</td>
</tr>
<tr>
<td>Italian Village</td>
<td>-0.2798</td>
<td>-0.2774</td>
<td>-1.0835</td>
</tr>
<tr>
<td>Livingston Park</td>
<td>-0.2153</td>
<td>-0.9343</td>
<td>0.9644</td>
</tr>
<tr>
<td>Milo and Grogan</td>
<td>-0.3004</td>
<td>-0.9387</td>
<td>0.1928</td>
</tr>
<tr>
<td>Mt. Vernon Plaza</td>
<td>-0.1245</td>
<td>-0.8351</td>
<td>-2.6879</td>
</tr>
<tr>
<td>Mt. Vernon South</td>
<td>-0.1620</td>
<td>-2.2591</td>
<td>-2.9654</td>
</tr>
<tr>
<td>North of Broad</td>
<td>-0.2865</td>
<td>-3.1031</td>
<td>-1.6802</td>
</tr>
<tr>
<td>Olde Towne East</td>
<td>-0.9148</td>
<td>4.0272</td>
<td>2.6105</td>
</tr>
<tr>
<td>Southside One</td>
<td>-0.5974</td>
<td>0.0274</td>
<td>1.6192</td>
</tr>
<tr>
<td>Southside Two</td>
<td>-0.3845</td>
<td>-0.0942</td>
<td>1.4709</td>
</tr>
<tr>
<td>Southtowne</td>
<td>0.8748</td>
<td>0.8717</td>
<td>1.5417</td>
</tr>
<tr>
<td>Sullivant Gardens</td>
<td>-0.9482</td>
<td>-1.0145</td>
<td>-0.7372</td>
</tr>
<tr>
<td>Town Franklin</td>
<td>-0.6105</td>
<td>3.2999</td>
<td>1.0591</td>
</tr>
<tr>
<td>Victorian Village</td>
<td>1.2231</td>
<td>0.7322</td>
<td>0.2393</td>
</tr>
</tbody>
</table>
highest positive loadings on this factor were percent single persons and percent one-person households; highest negative loadings were for number of persons per family, percent less than age twenty, and percent owner-occupied housing. Victorian Village scored less than one on this factor, and German Village had a negative score. These scores reflect the tendency for gentrified neighborhoods to have small households and few children. Further, many of the units in both neighborhoods are renter-occupied. Also of interest is that the two highest scoring neighborhoods on factor two, Olde Towne East and Town Franklin, have been identified as beginning to show signs of middle class investment.

The third factor explained twelve percent of the variation, and the highest positive loading (0.5765) was percent females in the labor force. The highest negative loadings were for percent widowed and percent over age sixty. Neither German Village nor Victorian Village had strong positive or negative scores. Thus, this factor does not provide differentiation between gentrified and non-gentrified areas.

In sum, examination at the scale of the inner city revealed that neighborhoods identified as gentrified differed from non-gentrified areas with respect to homeowner-
ship rates, property values, and other socioeconomic characteristics. The highest socio-economic status was found in German Village; also, changes occurred in German Village earlier than in the other gentrified neighborhood, Victorian Village.

**PATTERNS OF CHANGE WITHIN GENTRIFIED AREAS**

The image of gentrification at the small scale (within gentrified areas) is of a highly agglomerative process in which rehabilitation at one location tends to stimulate rehabilitation at immediately adjacent locations. This image is associated with the belief that strong positive externality effects between adjacent properties exist such that rehabilitation of one property enhances the likelihood of rehabilitation of nearby properties.

To test the view that gentrification is indeed spatially agglomerative, analysis at the level of the individual property was made. Data from German and Victorian Villages were used to establish that investment within a gentrifying area is indeed characterized by very strong spatial interdependencies.

Data are based upon the records of the Code Enforcement Department of the City of Columbus: the law requires a permit from the Code Enforcement Department for any proper-
ty rehabilitation, reconstruction or addition. Code Enforcement records include the estimated dollar value of the construction, its type (e.g., new roof, addition of a room or garage, sandblasting), the date of application, the property's location, and the year in which rehabilitation was carried out.

Use of the data present several problems for a study of gentrification, however. One limitation is the completeness as well as the reliability of the data. The extent to which improvement projects are not reported or values are underestimated poses a major problem. Further, there are problems with comparability of dollar values over a period of time due to inflation. The inflation problem is especially relevant, given the high rates of inflation during the latter part of the study period (1960-1980).

In addition, there is the question as to what the cutoff should be for a gentrified property. For example, in a given year, does a dollar investment of $5000 indicate gentrification? Does the addition of a garage classify a property as gentrified? Certainly, given the problem of off-street parking in the structurally-old neighborhoods where gentrification typically occurs, one could argue that a garage would indeed enhance the attractions of the property to a middle class renter or buyer.
Another problem to be considered is the timing of projects. Because extensive rehabilitation may take longer than one year—particularly if the work is done by the homeowner—the criterion for inclusion in the sample was projects completed within a five-year period.

The problem of comparability of dollar values has been solved by the use of an inflator. Estimates of building costs were based on the Boeckh Building Cost Index (base years 1926-1929). Index figures reflecting an average of costs for frame and brick construction for each year (1960-1980) were used to calculate the value of renovation projects in 1980 dollars.

With respect to the problem of the cutoff point, two criteria for gentrification were used and separate analyses made for properties defined according to those criteria. The first criterion is a dollar amount: to qualify as a gentrified property there must be an investment in 1980 dollars of at least $10,000 within a period of five consecutive years. The second criterion is much more all-encompassing. To count as rehabilitated there must be an investment in 1980 dollars of at least $5000 or the construction of a garage. Construction of new dwelling units was also included in this group of properties.

The years 1960-1980 were used in the German Village analysis and 1970-1980 in the Victorian Village case.
These time periods were chosen because gentrification is widely regarded as starting in German Village in 1960. On the other hand, the Victorian Village Society was not formed until 1973; it is apparent from the point maps for Victorian Village for 1960-1965 and 1960-1970 that there was little rehabilitation during the period 1960-1970 in Victorian Village.

Two types of analysis were carried out. First, quadrat count analysis, derived from the geographer's techniques of point pattern analysis, was used in an attempt to establish that rehabilitated properties in German and Victorian Villages are indeed clustered and that clustering could have been brought about by a spatially agglomerative process. Second, a method originally designed for the identification of growth poles in an inter-urban context was used. The objective was to establish that gentrification is characterized by a process of spatial contagion from a few discrete points within the study area. The two analyses were designed to be complementary, the first analysis providing evidence for a spatially agglomerative or contagion process at a smaller scale, and the second to document spatial agglomeration at a larger geographical scale.
Point Pattern Analysis

Maps for each of four time periods for German Village and Victorian Village, beginning with Figure 10, can be treated as point patterns. If the two study areas are divided up into sets of discretely bounded locations, patterns can then be analyzed for evidence of clustering, uniformity, or randomness. Clustering can be measured by the degree to which there is inequality in the number of points across those bounded locations. Conversely, the degree to which there is equality of points across quadrats is a measure of their uniformity, and finally, a pattern of random dispersion of points in which neither clusteredness nor uniformity may be found.

Quadrat count analysis is a popular approach to the spatial evaluation of point patterns. This is a technique borrowed from plant ecology (Harvey, 1966): a set of equal area cells or quadrats is thrown over the study area and the number of quadrats with zero, one, two points, etc., counted (see Table 11). The average number of points per quadrant is then calculated along with the variance in the number of points. The relationship between these two parameters can then be used as a guide to the dispersion of the point pattern under investigation. Thus, where the variance exceeds the mean the dispersion of points can be said to show a tendency towards clustering, the magnitude
Figure 10: Residential Properties Rehabilitated, German Village, Columbus, Ohio, 1960-1965. Rehabilitated properties include all those with an investment of at least $5000 in rehabilitation or in the addition of new living space; properties to which a garage was added are also included.
Figure 11: Residential Properties Rehabilitated, German Village, Columbus, Ohio, 1960-1970. Rehabilitated properties include all those with an investment of at least $5000 in rehabilitation or in the addition of new living space; properties to which a garage was added are also included.
Figure 12: Residential Properties Rehabilitated, German Village, Columbus, Ohio, 1960-1975. Rehabilitated properties include all those with an investment of at least $5000 in rehabilitation or in the addition of new living space; properties to which a garage was added are also included.
Figure 13: Residential Properties Rehabilitated, German Village, Columbus, Ohio, 1960-1980. Rehabilitated properties include all those with an investment of at least $5000 in rehabilitation or in the addition of new living space; properties to which a garage was added are also included.
Figure 14: Residential Properties Rehabilitated, Victorian Village, Columbus, Ohio, 1960-1965. Rehabilitated properties include all those with an investment of at least $5000 in rehabilitation or in the addition of new living space; properties to which a garage was added are also included.
Figure 15: Residential Properties Rehabilitated, Victorian Village, Columbus, Ohio, 1960-1970. Rehabilitated properties include all those with an investment of at least $5000 in rehabilitation or in the addition of new living space; properties to which a garage was added are also included.
Figure 16: Residential Properties Rehabilitated, Victorian Village, Columbus, Ohio, 1960-1975. Rehabilitated properties include all those with an investment of at least $5000 in rehabilitation or in the addition of new living space; properties to which a garage was added are also included.
Figure 17: Residential Properties Rehabilitated, Victorian Village, Columbus, Ohio, 1960-1980. Rehabilitated properties include all those with an investment of at least $5000 in rehabilitation or in the addition of new living space; properties to which a garage was added are also included.
of that tendency increasing with the magnitude of the ratio. On the other hand, if the mean exceeds the variance, there is evidence towards uniformity. Approximate equality of mean and variance indicates randomness.

Table 11
A Sample Quadrat Count Analysis

<table>
<thead>
<tr>
<th>X with X points</th>
<th>Frequency of Quadrats</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

Mean number of points per quadrat = $\frac{47}{36} = 1.31$

Variance of the number of points per quadrat = 1.38

Quadrat count data may also be analyzed with respect to the frequencies with which given numbers of points occur. The observed frequency distribution can be compared with theoretical distributions derived from probability laws. Thus theoretical frequencies derived from the Poisson distribution can be compared with the observed distribution by a chi-square "goodness-of-fit" analysis. The chi-square value allows a test of the null hypothesis that there is no difference between the observed distribution and a pattern of points distributed in accordance with the Poisson law. A pattern of points distributed in accordance with the
Poisson law would, of course, be random so this would constitute a test of the randomness of the dispersion.

Comparison of the actual frequency distribution with a theoretical distribution from some probability law suggests a further development of quadrat count analysis. In applying the quadrat count method to dwelling unit data, two aims can be met: first, to evaluate both the degree to which the point patterns can be said to be clustered and, second, to determine the degree to which the process producing the patterns can be said to be contagious. For both purposes quadrat count frequencies can be fit to theoretical frequencies derived from the negative binomial probability law. This generates a clustered pattern of points and has as one of its feasible generative processes one analogous to the type of agglomerative process believed to be important in gentrification.

If colonies are distributed randomly over an area so that the number of colonies observed in samples of fixed area has a Poisson distribution we obtain a negative binomial distribution for the total count, if the numbers of individuals in the colonies are distributed independently in a logarithmic distribution. (Anscombe, 1950, p. 360).

Quadrat count analysis is not without its problems, however. For a start, the relative frequencies one derives depend rather critically upon the size of quadrat adopted. With rather large quadrats, for example, a tendency towards uniformity might be the pattern, e.g., an average of one
point per quadrat and zero variance. Assuming that the density of points per unit area is not particularly large, however, it should be possible to so reduce the quadrat size as to produce a variance considerably in excess of the mean number of points per quadrat, so suggesting a tendency towards clustering. On the other hand, derivation of different results for different scales almost certainly indicates the presence of different scale-specific processes.

Further, the time period is rather lengthy and given that a process of contagion in the context of gentrification may be more or less powerful at different points in time, some breakdown of the total period for purposes of quadrat count analysis is needed. In addition, contagion occurs with respect to, and in the context of, what has already happened. Thus, if clustering declines over time, the degree of fit between the observed distribution and the theoretical distribution (based on negative binomial probability law) will be less for later periods than earlier periods. Likewise, a decline in the ratio of variance to mean is expected.

As a consequence of these considerations the study years were divided into cumulative periods. For German Village, the periods 1960-1965, 1960-1970, 1960-1975, and 1960-1980 were used. Because reinvestment began at a later date in Victorian Village, the periods 1970-1975 and 1970-1980 were used.
In addition to undertaking the analysis for cumulative periods in time, the problem of scale of analysis was addressed by using two very different quadrat sizes: 1) "small" quadrats are 40,000 square feet in area; 208 of these cover the German Village study area; 270 "small" quadrats make up the Victorian Village area; 2) "large" quadrats are each 160,000 square feet in area; there are 44 of these in the German Village study area and 64 in Victorian Village.

Finally, separate analyses have been undertaken for: 1) rehabilitated properties in which the investment exceeded $10,000, and 2) rehabilitated properties in which the investment was $5000 or more. In addition to fitting the observed distribution to a negative binomial distribution, the ratios of variances to means will be scrutinized.

Discussion of results of the quadrat count analyses for both German Village and Victorian Village follow. Results are presented in tables for cumulative time periods and for both German Village and Victorian, beginning with Table 12. The results for Victorian Village show less discernible patterns, mainly due to the shorter study period and fewer rehabilitated dwellings.

In each of the time periods in both German Village and Victorian Village the variance is in excess of the mean number of points per quadrat. Thus, clustering of points,
i.e., of rehabilitated dwellings, is indicated. The pattern can be further defined, however, by examining changes in the variance-to-mean ratio over time. In three of the eight cases, the value of the variance-to-mean ratio declines, thus giving the impression of reduced clustering over time. The three cases are (1) German Village—"large" quadrats, all properties (Table 14); (2) Victorian Village—"small" quadrats, all properties (Table 17); and (3) Victorian Village—"small" quadrats, investments of at least $10,000 (Table 19). There seem to be no clear trends indicating increased clustering of rehabilitated properties, although clustering seems to increase in large quadrats and investments of at least $10,000 in both German Village and Victorian Village.

For a more rigorous test of clustering, chi-square goodness-of-fit analysis (fitting the observed frequency distribution to a negative binomial distribution) was performed. Several conclusions emerge from an examination of the tables. The first is that in only two of the sixteen cases (1960-1980— all properties and "small" quadrats in German Village (Table 13) and 1970-1980— all properties

(10) In the Victorian Village case, comparison to a negative binomial probability distribution was only possible in the case of all properties and "large" quadrats and for the time periods 1970-1975 and 1970-1980. Quadrat-count analysis at the level of "small" quadrats yielded too few observations per quadrat. The starting point of 1970 was used because too few instances of rehabilitation were recorded before that date.
and "large" quadrats in Victorian Village (Table 18)) can
the null hypothesis that the point patterns are clustered
be rejected. In the Victorian Village case, this reflects
the strong linear pattern observed in rehabilitation.
Rather than rehabilitation spreading in all directions from
a point, the spread is linear, i.e., down a street. In
each case, computed chi-square values exceed the chi-square
value for incorrectly accepting the null hypothesis at the
ninety-five percent level of confidence.

Second, results are generally consistent with a conta­
gious process. A physical process generating the negative
binomial distribution is a contagious process (Harvey,
1966). On the other hand, several other distinct processes
are capable of producing a negative binomial probability
distribution; for example,

if the mean of a truly random distribution varies
from place to place we shall find a whole series
of Poisson populations within our study area and
if the mean density of these populations varies
in a specific way, quadrat sampling over the
whole area should yield a negative binomial dis­
tribution. (Harvey, 1966, p. 87).

Therefore a good fit of the negative binomial to an
observed distribution does not necessarily lead to the con­
clusion that the relevant process was contagious--only that
it could have been contagious.
Table 12

Observed and Expected Frequencies for Rehabilitated Houses in German Village: All Properties and "Small" Quadrats

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>151</td>
<td>149.8</td>
<td>105</td>
<td>104.7</td>
<td>67</td>
<td>65.5</td>
<td>50</td>
<td>47.8</td>
</tr>
<tr>
<td>1</td>
<td>46</td>
<td>43.5</td>
<td>68</td>
<td>66.7</td>
<td>68</td>
<td>66.1</td>
<td>56</td>
<td>61.6</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>10.0</td>
<td>23</td>
<td>25.9</td>
<td>33</td>
<td>41.4</td>
<td>46</td>
<td>47.6</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>2.1</td>
<td>10</td>
<td>7.9</td>
<td>24</td>
<td>20.6</td>
<td>30</td>
<td>28.7</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>2.7</td>
<td>1</td>
<td>2.1</td>
<td>11</td>
<td>8.9</td>
<td>11</td>
<td>14.8</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>0.6</td>
<td>4</td>
<td>3.5</td>
<td>10</td>
<td>6.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>1.9</td>
<td>5</td>
<td>0.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$\chi^2$ 1.59 1.70 3.30 33.81

$df$ .4 5 6 6

$\chi^2_{0.05} 9.5 11.1 12.6 12.6$

$\chi^2_{0.01} 13.3 15.1 16.8 16.8$

$\bar{x}$ 0.35 0.74 1.33 1.74

$\sigma^2$ 0.42 0.86 1.74 2.34

$\sigma^2/\bar{x}$ 1.20 1.16 1.31 1.34
Table 13

Observed and Expected Frequencies for Rehabilitated Houses in German Village: All Properties and "Large" Quadrats

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obs.</td>
<td>Exp.</td>
<td>Obs.</td>
<td>Exp.</td>
</tr>
<tr>
<td>0</td>
<td>15</td>
<td>16.8</td>
<td>6</td>
<td>4.6</td>
</tr>
<tr>
<td>1</td>
<td>14</td>
<td>11.9</td>
<td>5</td>
<td>8.2</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>7.1</td>
<td>10</td>
<td>8.9</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>3.9</td>
<td>9</td>
<td>7.6</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>2.1</td>
<td>6</td>
<td>5.6</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>1.1</td>
<td>1</td>
<td>3.8</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>0.6</td>
<td>4</td>
<td>2.3</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>0.6</td>
<td>2</td>
<td>1.4</td>
</tr>
<tr>
<td>8</td>
<td>1</td>
<td>0.5</td>
<td>3</td>
<td>3.4</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td>4</td>
<td>2.3</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>2</td>
<td>2.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ \chi^2 \]

3.28  

8  

15  

14.1  

19.7  

25.0  

18.5  

20.1  

24.7  

30.6  

1.36  

2.93  

5.45  

7.07  

2.64  

4.79  

7.79  

8.97  

1.94  

1.63  

1.43  

1.27
Table 14

Observed and Expected Frequencies for Rehabilitated Houses in German Village: At Least $10,000 Investment and "Small" Quadrats

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>152</td>
<td>155.2</td>
<td>110</td>
<td>110.2</td>
<td>70</td>
<td>68.6</td>
<td>55</td>
<td>52.0</td>
</tr>
<tr>
<td>1</td>
<td>49</td>
<td>41.3</td>
<td>66</td>
<td>64.5</td>
<td>71</td>
<td>70.3</td>
<td>59</td>
<td>62.4</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>9.2</td>
<td>24</td>
<td>22.9</td>
<td>35</td>
<td>40.8</td>
<td>45</td>
<td>45.6</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.9</td>
<td>6</td>
<td>6.7</td>
<td>22</td>
<td>17.7</td>
<td>26</td>
<td>25.6</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>0.4</td>
<td>1</td>
<td>1.6</td>
<td>9</td>
<td>6.5</td>
<td>15</td>
<td>12.3</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>0.2</td>
<td>1</td>
<td>2.1</td>
<td>1</td>
<td>4.2</td>
<td>5</td>
<td>5.4</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>2.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$X^2$  7.15  0.95  3.89  2.09  

$\frac{X^2}{df}$  1.21  1.14  1.16  1.31
Table 15

Observed and Expected Frequencies for Rehabilitated Houses in German Village: At Least $10,000 Investment and "Large" Quadrats

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>29</td>
<td>27.6</td>
<td>14</td>
<td>14.2</td>
<td>4</td>
<td>5.8</td>
<td>1</td>
<td>2.9</td>
</tr>
<tr>
<td>1</td>
<td>8</td>
<td>11.0</td>
<td>14</td>
<td>12.9</td>
<td>12</td>
<td>9.3</td>
<td>9</td>
<td>5.9</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>3.7</td>
<td>8</td>
<td>8.2</td>
<td>10</td>
<td>9.3</td>
<td>6</td>
<td>7.4</td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>1.7</td>
<td>2</td>
<td>4.5</td>
<td>5</td>
<td>7.3</td>
<td>7</td>
<td>7.3</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>2.2</td>
<td>6</td>
<td>5.0</td>
<td>9</td>
<td>6.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1.1</td>
<td>4</td>
<td>3.1</td>
<td>4</td>
<td>4.8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>0.9</td>
<td>1</td>
<td>1.8</td>
<td>2</td>
<td>3.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td>1</td>
<td>1.0</td>
<td>1</td>
<td>2.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>0.5</td>
<td>1</td>
<td>1.5</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td>0</td>
<td>0.3</td>
<td></td>
<td></td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>0.5</td>
<td></td>
<td></td>
<td>3</td>
<td>1.2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ x^2 \] = 1.42  
\[ df \] = 3  
\[ x^2_{0.05} \] = 7.8  
\[ x^2_{0.01} \] = 11.3  
\[ \bar{x} \] = 0.55  
\[ \sigma^2 \] = 0.75  
\[ \sigma^2/\bar{x} \] = 1.37  
\[ x^2 = 2.86  
\[ df = 6  
\[ x^2_{0.05} = 12.6  
\[ x^2_{0.01} = 16.8  
\[ \bar{x} = 1.43  
\[ \sigma^2 = 2.25  
\[ \sigma^2/\bar{x} = 1.57  
\[ x^2 = 4.28  
\[ df = 10  
\[ x^2_{0.05} = 18.3  
\[ x^2_{0.01} = 23.2  
\[ \bar{x} = 2.59  
\[ \sigma^2 = 4.51  
\[ \sigma^2/\bar{x} = 1.74  
\[ x^2 = 8.70  
\[ df = 10  
\[ x^2_{0.05} = 18.3  
\[ x^2_{0.01} = 23.2  
\[ \bar{x} = 3.73  
\[ \sigma^2 = 6.70  
\[ \sigma^2/\bar{x} = 1.80  


Table 16


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>242</td>
<td>186</td>
</tr>
<tr>
<td>1</td>
<td>15</td>
<td>38</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

\[
\bar{X} = 0.17 \quad 0.54 \\
\sigma^2 = 0.35 \quad 0.90 \\
\sigma^2 / \bar{X} = 2.07 \quad 1.65
\]
Table 17

Observed and Expected Frequencies for Rehabilitated Houses in Victorian Village, All Properties and "Large" Quadrats, 1970-1980

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Obs.</td>
<td>Exp.</td>
<td>Obs.</td>
<td>Exp.</td>
</tr>
<tr>
<td>0</td>
<td>28</td>
<td>28.2</td>
<td>12</td>
<td>7.7</td>
</tr>
<tr>
<td>1</td>
<td>19</td>
<td>17.3</td>
<td>7</td>
<td>12.2</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
<td>9.6</td>
<td>12</td>
<td>11.5</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
<td>4.5</td>
<td>10</td>
<td>10.2</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>1.3</td>
<td>13</td>
<td>5.8</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>1.3</td>
<td>5</td>
<td>4.5</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>0.6</td>
<td>0</td>
<td>3.2</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>1</td>
<td>1.9</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>3</td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>1</td>
<td>0.6</td>
<td></td>
</tr>
</tbody>
</table>

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$X^2$</td>
<td>3.62</td>
<td></td>
<td>32.9</td>
<td></td>
</tr>
<tr>
<td>df</td>
<td>6</td>
<td></td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>$X^2_{.05}$</td>
<td>12.6</td>
<td></td>
<td>16.9</td>
<td></td>
</tr>
<tr>
<td>$X^2_{.01}$</td>
<td>16.8</td>
<td></td>
<td>21.7</td>
<td></td>
</tr>
<tr>
<td>$\bar{X}$</td>
<td>1.1</td>
<td></td>
<td>2.8</td>
<td></td>
</tr>
<tr>
<td>$\sigma^2$</td>
<td>1.9</td>
<td></td>
<td>4.8</td>
<td></td>
</tr>
<tr>
<td>$\sigma^2/\bar{X}$</td>
<td>1.7</td>
<td></td>
<td>1.7</td>
<td></td>
</tr>
</tbody>
</table>
Table 18


<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>262</td>
<td>235</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
<td>27</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

\[ \bar{X} = 0.04 \quad 0.16 \]

\[ \sigma^2 = 0.05 \quad 0.19 \]

\[ \frac{\sigma^2}{\bar{X}} = 1.25 \quad 1.21 \]

Table 19

Frequencies for Rehabilitated Houses in Victorian Village, At Least $10000 Investment and "Large" Quadrats, 1970-1980
Spatial Diffusion

Support for the argument that the process is indeed contagious is, however, provided by the examination of the diffusion of rehabilitation activities within the study area as a whole. Diffusion of rehabilitation was examined by the use of an algorithm originally designed for the identification of growth poles in an inter-urban context (Casetti and Semple, 1968). The algorithm specifically searches for points from which the value for some dependent variable (e.g., the negative of the mean date for rehabilitation in each quadrat) declines. The resultant points are defined as growth poles. Points from which values of the dependent variable increase are defined as sinks. Resultant correlations permit an evaluation of the degree to which the overall pattern is "explained" by distance from a particular growth pole.

---

(11) The algorithm defines points from which, with increasing distance, values of some variable decline or increase. A summary of the application of the algorithm follows. The first step is to identify a set of points in a study area defined by rectangular coordinates. For each point, a correlation coefficient is computed. Given the resultant map of correlation coefficients, the point with the highest value is chosen; and the regression model computed for that point. Residuals for the variable in question are also computed. The operation is then repeated using residual values as the variable. This process allows the definition of growth poles (in this case the definition of a block from which rehabilitation spreads) and sinks, along with the variance explained by each growth pole and sink.
This algorithm was applied to sets of German Village and Victorian Village data. (mean dates of rehabilitation for the large quadrats for which this is possible, i.e., for which there is more than one instance of rehabilitation in the quadrat). In both instances in German Village some pattern is evident. In the case of Figure 18, quadrats 2-3 and 3-3 appear to be originating areas as do quadrat 5-4 and to a lesser degree, quadrat 7-5. In Figure 19, there seem to be similar diffusion movements centered on such quadrats as 2-1 and 8-3. In the case of properties in German Village with $10,000 or more invested, three growth poles and two sinks were identified (Table 20). Their locations are indicated on Figure 20, and their overall plausibility in terms of the map originally presented in Figure 18 should be readily apparent. Between them, these three growth poles and two sinks explain almost 50 percent of the total variance in mean rehabilitation dates. This supports the view that spatial contagion has been significant in the spatial development of gentrification.

In the analysis of all rehabbed properties in German Village (Figure 19) one growth pole and three sinks were identified (Table 21), providing a total level of explanation of just short of 33 percent. Their locations are indicated in Figure 21.
Figure 18: Mean Dates of German Village Rehabilitation: At Least $10,000 Investment. Dates are only shown for complete quadrats and for those not overlapping with Schiller Park; the latter quadrats are indicated with dashed lines.
Figure 19: Mean Dates of German Village Rehabilitation: All Properties. Dates are only shown for complete quadrats and for those not overlapping with Schiller Park; the latter quadrats are indicated with dashed lines.
Table 20

Growth Poles and Sinks: Rehabilitation Investment in German Village of at Least $10,000

<table>
<thead>
<tr>
<th>Growth Poles</th>
<th>Easting</th>
<th>Southing</th>
<th>% SS Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>51.0</td>
<td>-28.3</td>
<td>19.8%</td>
</tr>
<tr>
<td>#2</td>
<td>32.2</td>
<td>-122.9</td>
<td>7.5%</td>
</tr>
<tr>
<td>#3</td>
<td>80.7</td>
<td>-107.7</td>
<td>5.7%</td>
</tr>
<tr>
<td>Sinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1</td>
<td>33.2</td>
<td>-75.1</td>
<td>9.4%</td>
</tr>
<tr>
<td>#2</td>
<td>81.2</td>
<td>-90.3</td>
<td>5.6%</td>
</tr>
</tbody>
</table>

In the Victorian Village case, however, the growth pole analysis only accounted for less than one percent of the variance in mean rehabilitation dates. There may be several reasons for this. First, in the case of large investment (at least $10000), there were only fourteen quadrats with more than one observation, and the mean dates of rehabilitation exhibited no clear pattern of diffusion (see Figure 22). This was also true in the case of "all properties" (Figure 23). Second, the tendency toward clustering of investment in Victorian Village was not as strong as in German Village. The pattern was strongly linear rather than clustered around certain points.
Figure 20: Growth Poles and Sinks—German Village. Rehabilitation Investment of at least $10,000. Growth poles are indicated by black squares and sinks by empty squares. Coordinates are indicated along left and top margins.
Table 21
Growth Poles and Sinks: All Rehabilitated Properties, German Village

<table>
<thead>
<tr>
<th>Growth Poles</th>
<th>Easting</th>
<th>Southing</th>
<th>% SS Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>64.7</td>
<td>-25.3</td>
<td>12.2%</td>
</tr>
<tr>
<td>Sinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1</td>
<td>75.8</td>
<td>-59.3</td>
<td>8.6%</td>
</tr>
<tr>
<td>#2</td>
<td>65.1</td>
<td>-187.0</td>
<td>6.2%</td>
</tr>
<tr>
<td>#3</td>
<td>32.9</td>
<td>-75.1</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

\[ \text{Table 21} \]

Growth Poles and Sinks: All Rehabilitated Properties, German Village

<table>
<thead>
<tr>
<th>Growth Poles</th>
<th>Easting</th>
<th>Southing</th>
<th>% SS Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>64.7</td>
<td>-25.3</td>
<td>12.2%</td>
</tr>
<tr>
<td>Sinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1</td>
<td>75.8</td>
<td>-59.3</td>
<td>8.6%</td>
</tr>
<tr>
<td>#2</td>
<td>65.1</td>
<td>-187.0</td>
<td>6.2%</td>
</tr>
<tr>
<td>#3</td>
<td>32.9</td>
<td>-75.1</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

\[ \text{Table 21} \]

Growth Poles and Sinks: All Rehabilitated Properties, German Village

<table>
<thead>
<tr>
<th>Growth Poles</th>
<th>Easting</th>
<th>Southing</th>
<th>% SS Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>64.7</td>
<td>-25.3</td>
<td>12.2%</td>
</tr>
<tr>
<td>Sinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1</td>
<td>75.8</td>
<td>-59.3</td>
<td>8.6%</td>
</tr>
<tr>
<td>#2</td>
<td>65.1</td>
<td>-187.0</td>
<td>6.2%</td>
</tr>
<tr>
<td>#3</td>
<td>32.9</td>
<td>-75.1</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

\[ \text{Table 21} \]

Growth Poles and Sinks: All Rehabilitated Properties, German Village

<table>
<thead>
<tr>
<th>Growth Poles</th>
<th>Easting</th>
<th>Southing</th>
<th>% SS Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>64.7</td>
<td>-25.3</td>
<td>12.2%</td>
</tr>
<tr>
<td>Sinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1</td>
<td>75.8</td>
<td>-59.3</td>
<td>8.6%</td>
</tr>
<tr>
<td>#2</td>
<td>65.1</td>
<td>-187.0</td>
<td>6.2%</td>
</tr>
<tr>
<td>#3</td>
<td>32.9</td>
<td>-75.1</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

\[ \text{Table 21} \]

Growth Poles and Sinks: All Rehabilitated Properties, German Village

<table>
<thead>
<tr>
<th>Growth Poles</th>
<th>Easting</th>
<th>Southing</th>
<th>% SS Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>64.7</td>
<td>-25.3</td>
<td>12.2%</td>
</tr>
<tr>
<td>Sinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1</td>
<td>75.8</td>
<td>-59.3</td>
<td>8.6%</td>
</tr>
<tr>
<td>#2</td>
<td>65.1</td>
<td>-187.0</td>
<td>6.2%</td>
</tr>
<tr>
<td>#3</td>
<td>32.9</td>
<td>-75.1</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

\[ \text{Table 21} \]

Growth Poles and Sinks: All Rehabilitated Properties, German Village

<table>
<thead>
<tr>
<th>Growth Poles</th>
<th>Easting</th>
<th>Southing</th>
<th>% SS Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>64.7</td>
<td>-25.3</td>
<td>12.2%</td>
</tr>
<tr>
<td>Sinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1</td>
<td>75.8</td>
<td>-59.3</td>
<td>8.6%</td>
</tr>
<tr>
<td>#2</td>
<td>65.1</td>
<td>-187.0</td>
<td>6.2%</td>
</tr>
<tr>
<td>#3</td>
<td>32.9</td>
<td>-75.1</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

\[ \text{Table 21} \]

Growth Poles and Sinks: All Rehabilitated Properties, German Village

<table>
<thead>
<tr>
<th>Growth Poles</th>
<th>Easting</th>
<th>Southing</th>
<th>% SS Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>64.7</td>
<td>-25.3</td>
<td>12.2%</td>
</tr>
<tr>
<td>Sinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1</td>
<td>75.8</td>
<td>-59.3</td>
<td>8.6%</td>
</tr>
<tr>
<td>#2</td>
<td>65.1</td>
<td>-187.0</td>
<td>6.2%</td>
</tr>
<tr>
<td>#3</td>
<td>32.9</td>
<td>-75.1</td>
<td>5.9%</td>
</tr>
</tbody>
</table>

\[ \text{Table 21} \]

Growth Poles and Sinks: All Rehabilitated Properties, German Village

<table>
<thead>
<tr>
<th>Growth Poles</th>
<th>Easting</th>
<th>Southing</th>
<th>% SS Explained</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>64.7</td>
<td>-25.3</td>
<td>12.2%</td>
</tr>
<tr>
<td>Sinks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1</td>
<td>75.8</td>
<td>-59.3</td>
<td>8.6%</td>
</tr>
<tr>
<td>#2</td>
<td>65.1</td>
<td>-187.0</td>
<td>6.2%</td>
</tr>
<tr>
<td>#3</td>
<td>32.9</td>
<td>-75.1</td>
<td>5.9%</td>
</tr>
</tbody>
</table>
Figure 21: Growth Poles and Sinks—German Village, All Properties. Growth poles are indicated by black squares and sinks by empty squares. Coordinates are indicated along left and top margins. Note that Sink #3 is well to the south of the map.
Figure 22: Mean Dates of Victorian Village Rehabilitation: At Least $10,000 Investment
Figure 23: Mean Dates of Victorian Village Rehabilitation: All Properties

SUMMARY

In this chapter spatial and temporal patterns of gentrification were examined at three scales: city/suburb contrasts, differentiation within the inner city, and patterns
of change within gentrified areas. To measure changes at the scale of the metropolitan area, residential patterns of white collar workers were compared for four points in time, 1950, 1960, 1970, and 1980. Analysis of middle-class residential patterns indicated increased middle class occupancy in the central city throughout the three-decade period. Percentages of white collar workers in tracts towards the inner city were greater in each successive point in time. Increases in the density of middle class inner-city residents was not evident until after 1960.

Within the inner city, differences between gentrified neighborhoods and non-gentrified areas were observed. For example, property values in neighborhoods identified as gentrified were higher than in other areas. The two gentrified neighborhoods also ranked higher on socioeconomic characteristics such as occupational status, income, and years of education, and had fewer residents under age twenty or over age sixty. Of interest, however, is the observation that differences between areas within the inner city were not marked until after gentrification "took off" in certain neighborhoods (approximately 1960 in German Village, 1973 in Victorian Village). This will be examined further in the discussion of the gentrification process in Chapter IV.
The third scale of analysis of pattern was within the neighborhood. Specifically, patterns of investment were examined to test the view that gentrification is spatially agglomerative. In the German Village case, investment was found to be clustered and some support was found for diffusion from particular points. For Victorian Village, where gentrification did not take off until after 1970, investment patterns were strongly linear and more localized (as indicated by coefficients of variation), particularly for large (at least $10000) investments. Spatial and temporal pattern, especially the contagion effect, will be further examined as part of the study of process.
Chapter IV

THE GENTRIFICATION PROCESS

of clear importance to a study of gentrification is an examination of the process producing its characteristic spatial and temporal patterns. In this chapter the gentrification process will be examined at three scales—the urban area as a whole, inner city, and the neighborhood. These different analyses serve three respective functions. First, analysis of changes in occupation and household composition is made to situate the phenomenon within the urban process, i.e., with respect to social, economic, and physical changes in the urban area. Second, study at the level of the inner city addresses the question of the precise location of gentrification within the inner city; and third, analysis at the within-neighborhood level serves to provide a basis to test an individualistic, demand-led characterization of the gentrification process.

At the neighborhood level, the real estate investment process including types and scale of investment will be addressed. A review of the literature leads one to the conclusion that the gentrification process has been led by
"individual pioneers and homesteaders whose sweat equity, daring and vision are paving the way for those among us more timid." (Smith, 1983, p. 6). Also contained within research from a neoclassical viewpoint, however, is the recognition of the role played by real estate professionals. For example, Black, Borut, and Dubinsky (1977 Byrne (1974), and Clay (1974) cite developers/realtors as a significant group of investors in gentrifying neighborhoods. Intuitively, the dominance by real estate professionals is more plausible because of their presumed knowledge of the market and their desire and indeed the necessity for them to expand their market. This general hypothesis—that gentrification has been engineered more by real estate professionals than by other groups—will be evaluated using data from the German Village study area.

Also of interest within the central city is the selection out of particular neighborhoods, i.e., why are some inner-city neighborhoods "gentrified" and not others? Two possible explanations are suggested in the literature. Thus it has been argued that housing and population characteristics in some neighborhoods are more amenable to gentrification by virtue of their, e.g., location, architecture, or a population susceptible to displacement. Also suggested in the literature is the impact of public action in the form of grants and loans or architectural controls.
A third process may also be at work, however; there is the possibility of a random origin and contagion process. In other words, gentrification may receive its impetus from a series of real estate investment "mistakes". If these mistakes occur within a condensed spatial and temporal pattern, they can become mutually cancelling so that a contagion process may take hold.

The relation between the post-industrial city and middle class rehabilitation is also addressed. A link between rehabilitation of inner-city neighborhoods for middle class use and changes in the urban process at economic, political, and sociocultural levels will be examined. In particular the importance of the development of office employment in the CBD will be addressed.

GENTRIFICATION WITHIN THE POST-INDUSTRIAL CITY

The link in this study of the gentrification process relating to the process at the scale of the metropolitan area is perhaps the most important in understanding changes in residential patterns. Gentrification must be seen in relation to broader changes at economic, political, and sociocultural levels and how these changes are reflected in metropolitan areas. With respect to the economy, for example, there has been a decline in the role of unskilled labor and an increase in the importance of technology, the
emergent dominance of white collar employment and a shift to a service economy. Changes at the political level are seen in the increasing activity of the state. Sociocultural changes are manifested in part by shifts in household composition and labor force participation. For example, there are more women in the workforce (and many of the support functions related to white collar employment are filled by women), more two-earner families, and more single-person households.

In the literature much is made of the growth of white collar employment in the central city and its association with gentrification. Young, white collar employees working in professional, managerial, and technical occupations are said to be attracted to central city residential areas for convenient location with respect to work, services, and cultural amenities. This argument is then coupled with changes in household and family structure to explain the demand for central city housing. For example, households are more likely to be headed by a single person with or without children or have two earners rather than the "father as bread winner, mother at home with two children" model. These new household forms also have different needs, e.g., convenience, services (food, child care) support. The low-density, isolated suburban forms of housing do not answer their needs.
The object of this section is to test the association between gentrification and shifts at economic and sociocultural levels. A general hypothesis is that residential changes in inner-city neighborhoods mirror changes in CBD employment. The expectation is that the number of younger, single, white collar, CBD employees has increased in gentrified areas. Patterns in non-gentrified areas will also be examined in anticipation of change in the opposite direction, i.e., increase in older and blue collar residents.(12)

To document these changes, a random sample of one hundred twenty addresses from gentrified and non-gentrified areas within one-and-one-half miles of the central business district was drawn from listings in the R. L. Polk and Company Columbus City Directory. Forty addresses were selected for each of two gentrified neighborhoods and the remaining forty addresses were from non-gentrified areas. Names of residents at each address in four years, 1950, 1960, 1970, and 1980, were also obtained from the directory, along with the marital status, occupation, and place of work of each resident. Compilation of these data permitted the observation of changes in the population of neighborhoods with respect to age (number of widows and retirees),

(12) These changes in non-gentrified neighborhoods may reflect a displacement process, with older and blue collar workers moving from gentrified to non-gentrified areas.
Characteristics of Residents

With respect to marital status of residents, there were changes in both gentrified and non-gentrified neighborhoods during the years 1950-1980. The percentage of married couples declined in both areas but more so in non-gentrified areas (see Table 22): the proportion of married-couple households decreased by 67.3 percent in non-gentrified areas and by 37.8 percent in gentrified neighborhoods. In contrast the number of single-person households increased overall, but the increase was greater in gentrified neighborhoods. The most striking change with respect to marital status, however, was in the number of widows. In non-gentrified areas, the percentage of widows increased from three percent of occupied households in 1950 to 8.3 percent in 1980 (see Figure 24). The change was in the opposite direction in gentrified neighborhoods: widows comprised 15.2 percent of the residents in 1950, but there were no widows in the 1980 sample.

The decrease in number of widows indicates a decline in older population in gentrified areas, while the large increase in singles could be associated with an increase in younger residents. Occupational data support this conclusion. The percentage of the labor force retired in non-gentrified areas in 1980 is over five times greater than in
Table 22

Marital Status of Central City Residents, 1950-1980

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G %</td>
<td>G %</td>
<td>G %</td>
<td>G %</td>
</tr>
<tr>
<td>Married</td>
<td>63.8</td>
<td>64.5</td>
<td>52.6</td>
<td>50.7</td>
</tr>
<tr>
<td>Single</td>
<td>19</td>
<td>19.0</td>
<td>32</td>
<td>32.0</td>
</tr>
<tr>
<td>Widows</td>
<td>10.0</td>
<td>10.0</td>
<td>12.7</td>
<td>16.0</td>
</tr>
<tr>
<td>Separated Females</td>
<td>10.0</td>
<td>9.1</td>
<td>3.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

G=gentrified neighborhood; NG=non-gentrified neighborhood

Figure 24: Changes in Widowed Population, Gentrified Versus Non-Gentrified Areas, 1950-1980
gentrified neighborhoods (see Table 23 and Figure 25). Neither area had retirees in the 1950 sample.

Table 23

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G</td>
<td>NG</td>
<td>G</td>
<td>NG</td>
</tr>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Blue Collar</td>
<td>35</td>
<td>81.4</td>
<td>16</td>
<td>76.2</td>
</tr>
<tr>
<td>White Collar</td>
<td>8</td>
<td>18.6</td>
<td>5</td>
<td>23.8</td>
</tr>
<tr>
<td>Retired</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Student</td>
<td>0</td>
<td>0.0</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total</td>
<td>43</td>
<td>100.0</td>
<td>21</td>
<td>100.0</td>
</tr>
</tbody>
</table>

G-gentrified neighborhood; NG-non-gentrified neighborhood

The results with respect to occupational status also parallel the expected characteristics of gentrifiers. Of interest here is that in 1950, there were more white collar workers in the areas classified as non-gentrified in 1980 than in the to-be-gentrified areas. This situation had completely reversed itself by 1980, with no white collar workers recorded in non-gentrified areas and 47.5 percent
in gentrified areas classed as white collar. When white collar workers are examined as a percent of white collar plus blue collar workers, the differences are even more striking (Table 24). In 1950 and 1960, there were more white collar workers in non-gentrified areas; and indeed, the percentage of white collar workers in gentrified areas declined between 1950 and 1960. The greatest loss of white collar workers in non-gentrified areas occurred between 1960 and 1970, while the largest increase in gentrified areas was between 1970 and 1980. Declines in blue collar
workers were found in all areas. From the occupational data the pattern emerges of an aging blue collar population in non-gentrified areas versus a younger, white collar group of residents in gentrified areas of the inner city.

Table 24

Comparison Between White Collar and Blue Collar Workers in Inner-City Areas, 1950-1980

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G</td>
<td>NG</td>
<td>G</td>
<td>NG</td>
</tr>
<tr>
<td>White Collar (as a percent of white collar plus blue collar)</td>
<td>19.0</td>
<td>23.0</td>
<td>12.5</td>
<td>32.0</td>
</tr>
<tr>
<td>Blue Collar (as a percent of white collar plus blue collar)</td>
<td>81.0</td>
<td>77.0</td>
<td>87.5</td>
<td>68.0</td>
</tr>
</tbody>
</table>

G=gentrified neighborhood; NG=non-gentrified neighborhood

Another characteristic of the post-industrial city associated with gentrification is the dramatic increase in CBD office employment. To document the putative link between gentrification and white collar office employment, occupations and place of work of inner city residents were examined (see Table 25). Unfortunately the place of work was available for only a small portion of the sample; the data, therefore, are not very conclusive, and figures for non-gentrified areas for 1980 are especially suspect. The pro-
portion of residents employed in CBD office employment was greater in non-gentrified areas in all periods except 1970. However, not all CBD office employees are in white collar occupations. When white collar employees are separated from the total, the balance of white collar employees residing in gentrified areas is clearly in the majority (see Figure 26).

Table 25

Place of Employment for Central City Residents, 1950-1980

<table>
<thead>
<tr>
<th>Place of Employment</th>
<th>Time and Neighborhood Type</th>
<th>1950</th>
<th>1960</th>
<th>1970</th>
<th>1980</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G</td>
<td>n</td>
<td>%</td>
<td>G</td>
<td>n</td>
</tr>
<tr>
<td>Central City</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office Employment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White Collar</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table data continues...
Based on these data it would seem that there is an association between gentrification and changes in the urban process. The shift toward a white collar (managerial, technical, professional) dominated economy is reflected in the residential patterns of "preferred" inner-city neighborhoods. Changes at the sociocultural level are also evident—a shift in the population of gentrified areas toward younger households could also be observed.
The question remains as to why gentrification occurred in German Village rather than in other central city neighborhoods. The gentrification literature provides no understanding of why gentrification occurs precisely where it does. In terms of market factors discussed in the literature (supply of old, well-built and architecturally interesting housing, location adjacent to CBD, e.g.) it would seem that gentrification could take place at many points around the central business district. The question then is why gentrification occurs in some neighborhoods and not in others and at some times and not at others. Three aspects of this selection process will be discussed:

1. housing and population characteristics of gentrified neighborhoods as opposed to those of other inner city neighborhoods;
2. the role of public action in support of rehabilitation;
3. the possibility of a random origin and contagion process.

Neighborhood Characteristics

Characteristics of German Village can be compared with those of other inner-city neighborhoods. The expectation is that gentrified neighborhoods will be quite different from other inner-city areas with respect to such variables as property values and rates of home ownership, vacancy,
and dilapidation. Specifically, differences are expected in time periods just prior to gentrification.

To test this argument, data for German Village for 1950 and 1960 were compared with non-gentrified areas. Fifteen German Village blocks and fifteen blocks from within an area one-and-one-half miles of the city center were randomly selected. The variables used in the comparison were housing value, percent home owner, percent vacant, and percent dilapidated.

With respect to housing value, the average value in German Village was lower than in non-gentrified areas in both 1950 and 1960 (see Table 26). Thus lower costs would seem to make German Village more attractive to potential investors. The cost factor coupled with lower rates of dilapidation in 1960 (as shown in Table 27) also favored German Village over other areas. The fact that vacancies were also lower in German Village in 1960 (see Table 28) than in other areas, is possibly due to this lower cost and higher quality.

It appears then that although not significant, there were differences between German Village and non-gentrified areas just prior to investment in German Village rehabilitation. The high degree of variation in values for non-gentrified areas, however, indicates that there may have been other neighborhoods with characteristics similar to German Village.
Table 26
Average Housing Values in German Village and Non-Gentrified Areas, 1950-1980

<table>
<thead>
<tr>
<th>Average Housing Value</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1950</td>
</tr>
<tr>
<td></td>
<td>x</td>
</tr>
<tr>
<td>German Village</td>
<td>3920</td>
</tr>
<tr>
<td>Non-gentrified Areas</td>
<td>4353</td>
</tr>
</tbody>
</table>

Table 27
Percentage of Dilapidated Housing Units in German Village and Non-Gentrified Areas, 1950-1980

<table>
<thead>
<tr>
<th>Dilapidated Housing Units (Percent)</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1950</td>
</tr>
<tr>
<td></td>
<td>x</td>
</tr>
<tr>
<td>German Village</td>
<td>31.0</td>
</tr>
<tr>
<td>Non-gentrified Areas</td>
<td>31.7</td>
</tr>
</tbody>
</table>
Table 28

Percentage of Vacant Housing Units in German Village and Non-Gentrified Areas, 1950-1980

<table>
<thead>
<tr>
<th>Vacant Housing Units</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1950</td>
</tr>
<tr>
<td></td>
<td>x</td>
</tr>
<tr>
<td>German Village</td>
<td>1.58</td>
</tr>
<tr>
<td>Non-gentrified Areas</td>
<td>1.10</td>
</tr>
</tbody>
</table>

Role of Urban Renewal

A second factor in determining the location of gentrification is the presence of public action supporting investment. Specifically, urban renewal has functioned as a critical pre-condition for many gentrification projects, and the two Columbus cases are no exception. Urban renewal clearance occurred in an area immediately northeast of German Village in the late 1950's, and the cleared land on the northern boundary was used for interstate highway construction. Part of the Village was also slated for clearance, but the area was not a priority location for renewal and so clearance was postponed.

On the other hand, most accounts of German Village imply that its development occurred in spite of urban renewal.
To the contrary, it would seem that urban renewal played a role in removing less desirable property just north of the area and creating a well defined northern boundary (interstate highway plus commercial strip). Other action by local government aiding German Village development was assistance in gaining recognition as an historic area and cooperation with establishing and enforcing architectural controls on rehabilitation.

In contrast with the German Village case, urban renewal played a visible and an active role in Victorian Village. Urban renewal began in the mid-1950's on the southern border of what is now Victorian Village. An entire section of low-income housing— an area known as "Flytown" and considered at the time to be the worst slum in Columbus—was cleared for a high rise apartment building for the elderly and a small shopping center. Later, more area was cleared for a large low-rise apartment complex. Then, in 1965, federal funds were obtained to acquire and demolish dwellings throughout the Victorian Village area that were judged "beyond repair" or stood in the way of development of a hospital complex in the neighborhood. In this way the worst units in the area were cleared.

Federal funding also provided for capital improvements such as street resurfacing and lighting. In addition, federal grants and loans for maintenance and rehabilitation
were made available. According to Berry (1979), this assistance was used mostly by landlords and developers rather than resident owners.

In both Columbus cases urban renewal and other federal rehabilitation activity preceded development by about ten years. And, in both cases, the urban renewal activity removed potential obstacles to development of the area. Support—both monetary or in the form of controls and enforcement—was given to both neighborhoods. In other words, conditions for investment were enhanced by state activity.

**Random Origin and Contagion Processes**

Cross-sectional data for the time period just prior to gentrification show that although there were differences in the characteristics of gentrified neighborhoods, the differences were not statistically significant. Thus, the contrast is not as striking as one might expect in order to explain the location of gentrification. Precise locations for gentrification may depend, at least in part, on an element of chance. The rationale for this argument follows.

All real estate development has a very critical speculative element with spatial and temporal parameters. With respect to space, Davis and Whinston (1965) argued that maintenance and improvement of real estate provides positive externalities for neighboring investors and so every
individual property owner has an incentive not to invest. The hope is that neighbors will invest and the owner will then be the beneficiary of rising real estate values at the expense of the neighbors. Conversely, investors may be hesitant to rehabilitate without any assurance that neighboring owners will likewise invest and so provide a neighborhood ambiance attractive to "gentrifiers". These externality effect considerations present barriers to the initiation of the gentrification process. Indeed, the implication is that initiation is only likely to occur in circumstances where the externality consideration is somehow suspended in a particular neighborhood. Further, externality problems are heightened by the severe fragmentation of ownership typical of inner city neighborhoods and perhaps by the problem of obtaining finance. Urban renewal offered a partial suspension of these obstacles.

Problems of uncertainty in a spatial context are compounded by those in a temporal context. Specifically, if several property owners in a particular neighborhood rehabilitate their properties, to what extent can they be assured of a market for their properties? For example, can property owners believe media reports of a return of the middle class to the inner city? The result is the "prisoner's dilemma," i.e., every property owner is waiting for every other to be the first to invest in rehabilitation.
The following suggests a way out of this deadlock. If several property owners—and possibly their lenders—make, what might in the real estate business be called "mistakes"; and if those "mistakes" are made within a certain spatial and temporal pattern such that they are mutually cancelling, then a self-generating and cumulative gentrification process may be generated.

There are many sources of real estate "mistakes", e.g., misinformation or different attitudes toward risk. Attitudinal surveys of landlords typically reveal a variety of opinions on the problems (or lack thereof) of investment in "declining" neighborhoods (U.S. Department of Housing and Urban Development, 1973). In addition, all property owners do not necessarily operate purely in terms of a return-to-investment calculus. Homeowners in particular are likely to invest for their own personal use values as may resident landlords of apartment buildings (Sternlieb, 1969, p. 173).(13)

These "mistakes" may then occur in a pattern over space and over time so as to be mutually cancelling. Although the dispersion of "mistakes" is expected to be random, it may exhibit substantial local clustering. One such instance of a random distribution across five neighborhoods —------------

(13) The Pavey one-block, one-man rehabilitation is an example of use-value motivation. Renovation of homes on "his" block was done more for the pleasure a renovated neighborhood afforded the owner and less in terms of possible rent increases.
and five points in time is given by Figure 27. Thus ten "mistakes" occur in neighborhood #4 in the fourth time period but only two in neighborhood #1 in the third time period.

<table>
<thead>
<tr>
<th>Neighborhoods</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Periods</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>8</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 27: A Simulated Random Distribution of Events Across Five Neighborhoods and Five Points in Time

This simulation shows that quite by chance, clusters of rehabilitated properties can be created. These clusters may give impetus to a self-propelling process of gentrification.

(14) The simulation includes five neighborhoods and five points in time, or five times five equals twenty-five "locations" for "mistakes" to occur. Each location is assigned four random numbers from the series 00-99. Numbers are then drawn from a random number table and assigned to neighborhood-time classes accordingly.
cation. Thus, the chance creation of at least the beginnings of a more attractive neighborhood environment may act to raise property values and so encourage property owners either to sell out to middle class buyers or to rehabilitate the properties themselves. Further impetus is given to the process as, e.g., lender confidence builds, and as the gentrifiers come together to lobby the city for infrastructural improvements. Diffusion of gentrification may proceed from the initial nuclei, and to the extent that the initial properties are located in close proximity, a fairly large and compact area may be rehabilitated.

This explanation seems plausible for several reasons. First, fitting the German Village rehabilitation pattern to a negative binomial distribution demonstrated that gentrification seems to have some contagion effects and does indeed seem to proceed by diffusion from randomly located clusters. Second, casual observation (provided by case study reports in the literature) supports the argument for random factors as providing the basis for the original cluster from which gentrification then proceeds. For example, many case study reports include tales of the initial work of pioneers with an extra-market interest in rehabilitating properties and which encouraged other investors. German Village is a case in point.
Frank Fetch completed the first renovation in German Village in 1948. The property was intended to be rental units, but Fetch decided to live in it. He rehabilitated three other properties before 1959, and in that year a news story brought attention to his efforts and generated local interest in German Village. From the core of interested persons came the initiation of the German Village Society, a group formed to promote the Village through tours and protection of architectural standards. Also of assistance was Fetch's position in the City Department of Development giving him informal veto rights on rebuilding requests (Berry, 1979).

Explanation for the precise location of gentrification within the central city may be found in the examination of three variables—characteristics of the neighborhood, public support, and chance. At the very least, it can be argued that the factors are not mutually exclusive, and there may be interactions between the three variables. For example, it may be that government investment (and rezoning) decisions are part of the random pattern of these decisions which may be mutually cancelling or reinforcing. Or, it could be that localized state intervention has often been a consequence of the emergence of a nuclei of investors. Differences in neighborhood characteristics may be
the least important factor. Although German Village was observed to be different from the inner city as a whole with respect to variables favoring investment (low cost, higher quality), there may have been other neighborhoods with similar characteristics. The initial investors may have been attracted by lower prices in the area; on the other hand, however, investors aware of plans for urban renewal may have been attracted by the potential for profitable sale— to the government if the area were cleared, or to other investors if renewal sparked a "turnaround" in the area.

THE REAL ESTATE INVESTMENT PROCESS

The aim of this particular analysis is to learn more about the real estate investment process. Specifically, the emphasis is on countering demand-led theories of gentrification. The problem with such theories is that supply is seen as unproblematic; the argument to be made here, in contrast, is that demand for a good presupposes a supply of the good. Hence, the role of real estate professionals as one group active in creating a necessary presupposition of demand for inner-city housing—a supply of rehabilitated housing—will be investigated. Intuitively it would seem that the more important role in the gentrification process would be played by real estate interests. One could
hypothesize that real estate professionals view these areas as favorable for investors seeking capital gains and/or income-producing properties. Clay (1983), for example, cited new residents as key actors in revitalization in seventy percent of fifty-seven neighborhoods in major U.S. cities; further, real estate professionals were involved in eighty-one percent of the cases.

Another dimension to this argument has been added by Pattison (1983). In a case study of the Bay Village area in Boston, he observed not one gentrification process, but several processes occurring at successive points in time. He identified three stages. The area was first attractive to "risk oblivious" groups (e.g., artists, gays, single parents, interracial couples) with different needs (e.g., support group, acceptance, self-expression, non-rejection). Increased maintenance and "sprucing" up could be observed during this period.

In the second stage, the neighborhood became attractive to "risk-prone" investors—those who evaluate risks and decide to gamble. Real estate professionals may be included in this group, although they may minimize risk by investing smaller dollar amounts. Finally, investment is made by the "risk-averse"—those willing to invest once the perceived risk has been assumed or reduced by others. Young professionals are perhaps the prototypical investors at this stage.
Intuitively, the "stage" hypothesis seems quite plausible. The object of this analysis then is to test the argument to the extent that appropriate data are available. Using data from German Village in Columbus, it is possible to examine types of investors, amounts invested, timing of investment and to determine if patterns of investment similar to Pattison's stages emerge.

Investment patterns were studied with respect to type of investor, property exchange, and amount of investment in rehabilitation. Specifically, answers to the following questions were sought:

* Who bought and rehabilitated property in German Village during the years 1950-1980?
* Who bought more than one property?
* How much was invested in rehabilitation?
* How long were properties held?

Answers to these questions can be found by examining property transaction records, building permits, and occupations of owner and by grouping these data according to time period within the years 1950-1980. The results of this analysis will serve to evaluate the hypothesis that real estate professionals were the major investors in German Village, especially during the years 1965-1975. The data will also provide insight into the timing and amount of investment by different investor groups, presumably with different investment motives.
Data Collection

The starting point for collection of investment data was the individual property. A ten percent random sample of the 2264 properties listed for German Village in the R. L. Polk and Company Columbus City Directory produced a list of two hundred twenty-five properties. Records of transfer for these properties for the years 1950-1980 were obtained from the office of the Franklin County Auditor, and records of rehabilitation investment (including date and dollar value of rehabilitation) were obtained from the building permit data (discussed in Chapter III). The date of rehabilitation was matched with dates of property transfers to determine the names of owners who rehabilitated properties. Occupations of rehabbing owners were then obtained from the Polk city directory.

With these records, investments could be grouped into time periods and by amount and type of investor (real estate professional or not). Length of ownership for each property was also determined. Thus differences between investor types could be established with respect to time, amount of investment, and length of ownership.
Owners of German Village Property

The focus of this analysis is the investor in the rehabilitation of German Village property. The criterion used to define such an investor is the expenditure of at least $5000 (in 1980 dollars and within a five year period) for repair/remodeling/renovation of a German Village dwelling. The sample of two hundred twenty-five properties—when matched with rehabilitation data and property owners—produced sixty-three cases of at least $5000 investment (28.4 percent).(15)

Classification of rehabilitation activity by amount and time period revealed an increase over time in activity and amount spent (see Table 29): over a third of the investment was made between 1976 and 1980. This growth in investment supports the idea of a contagion effect over time (but not necessarily over space).

Not only were more projects completed in later time periods, but also more money was invested. During 1960-1965, one-third of the investors spent more than $10,000; but in the last time period over sixty percent of the owners invested at least $10,000. This suggests growth in investor confidence or a perceived reduction in risk in

(15) This proportion of rehabilitated properties (28.4 percent) is slightly higher than for German Village properties as a whole; 534 of the 2264 properties (23.6 percent) in German Village were counted as rehabilitated between 1950-1980 according to records of the Office of Code Enforcement of the City of Columbus.
Table 29

Investment in German Village Property, 1950-1980

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>n=9</td>
<td>n=11</td>
<td>n=20</td>
<td>n=23</td>
</tr>
<tr>
<td>$5000-</td>
<td>$10000</td>
<td>$5000-</td>
<td>$10000</td>
<td>$5000-</td>
<td>$10000</td>
</tr>
<tr>
<td>9999 &amp; over</td>
<td>9999 &amp; over</td>
<td>9999 &amp;</td>
<td>9999 &amp;</td>
<td>9999 &amp;</td>
<td>9999 &amp;</td>
</tr>
</tbody>
</table>

| Total Number | 6  | 3  | 5  | 6  | 10 | 10 | 9  | 14 |
| Percentage in each time period | 14.3 | 17.5 | 31.7 | 36.5 |

The area and also serves to support the idea of a contagion effect over time.

The data presented in Table 29 and three successive tables also provide answers to questions about differences in types of investors. Investors were first divided into two categories—real estate professionals or not (see Table 30). These two groups were used in order to focus on differences in orientation to use value/exchange value and as a means of challenging the argument for "spontaneous" consumer demand for inner city housing and, conversely, of
suggesting that demand was orchestrated by capital investment in the inner city, i.e., "a return to the city by capital, not people" (Smith, 1979). The expectation is that real estate professionals (REP's), being more interested in the exchange value of property, would represent a greater proportion of investors in earlier time periods, invest less in rehabilitation, and be more likely to sell properties and/or hold properties for shorter time periods. On the other hand, other investor types would be expected to invest in later time periods, invest more dollars in rehabilitation, hold properties for longer periods, and be less likely to sell.

Table 1:

Differences in Investment by Real Estate Professionals Versus All Other Investor Types, German Village, 1950-1980

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Investor Type</td>
<td>n=9</td>
<td>n=11</td>
<td>n=20</td>
<td>n=23</td>
<td></td>
</tr>
<tr>
<td>Real Estate Professionals</td>
<td>3 (33.3)</td>
<td>5 (45.5)</td>
<td>6 (30.0)</td>
<td>4 (17.4)</td>
<td>18 (28.6)</td>
</tr>
<tr>
<td>All Other Investors</td>
<td>6 (66.7)</td>
<td>6 (54.5)</td>
<td>14 (70.0)</td>
<td>19 (82.6)</td>
<td>45 (71.4)</td>
</tr>
</tbody>
</table>
Table 31

Amount of Investment in German Village Property Rehabilitation by Real Estate Professionals Versus All Other Investor Types, 1950-1980

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Investor Type</td>
<td>$5000-$9999</td>
<td>$10000-19999</td>
<td>$10000-$19999</td>
<td>$20000-$19999</td>
</tr>
<tr>
<td>Real Estate Professionals</td>
<td>3 (50.0)</td>
<td>0 (0.0)</td>
<td>9 (0.0)</td>
<td>5 (0.0)</td>
</tr>
<tr>
<td>All Other Investors</td>
<td>3 (50.0)</td>
<td>3 (100.0)</td>
<td>3 (100.0)</td>
<td>1 (16.7)</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>3</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Of the sixty-three investors, eighteen or 28.6 percent were real estate professionals. This group invested in German Village most heavily during the period 1966-1970: 45.5 percent of the investment made during that period was by real estate professionals. During the first period 33.3 percent of the investors were real estate professionals, and in the two later periods real estate professionals represented thirty and 17.4 percent, respectively. (16)

(16) One could devise a scenario of increasing interest in the German Village area during the 1960’s as information about the area spread throughout the market, as confidence grew, and before prices began to rise—followed by a pulling back as other groups began to invest and prices increased. This pattern is also reflected in amounts spent on rehabilitation (see
Real estate professionals also differed from other investors with respect to length of ownership. As indicated in Table 32, 61.6 percent of the REP's had sold their property before the end of the study period, compared with 48.9 percent of all other investors. Also, REP's owned properties for shorter time periods, an average of 3.25 years compared with just over five years for all other owners.

Table 32
Length of Ownership of German Village Properties by Type of Investor

<table>
<thead>
<tr>
<th>Investor Type</th>
<th>Properties Sold</th>
<th>Properties Not Sold</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(In Years)</td>
<td>(Number)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Number</td>
<td>Average Range</td>
<td></td>
</tr>
<tr>
<td>Real Estate Professionals</td>
<td>11 (61.1)</td>
<td>3.25 1-8</td>
<td>18 (100.0)</td>
</tr>
<tr>
<td>Other</td>
<td>22 (48.9)</td>
<td>5.06 0-17</td>
<td>45 (100.0)</td>
</tr>
</tbody>
</table>

In examining the data for differences according to investor type, another group surfaced: the German Village resident landlord (see Table 33), i.e., an investor--though

Table 25). During the first time period, all real estate professionals invested between $5000-9999 in rehabilitation. A complete reversal occurred during the later half of the sixties when all real estate professionals invested more than $10,000. The "pulling-back" during the seventies is reflected in an increase of lower investment amounts: half of the real estate professionals spent less than $10,000 in 1971-1975, and three-fourths spent less than $10,000 during 1976-1980.
not a real estate professional—who owns rental property and also resides in German Village. The existence of such a group provides support for the importance of use value as part of the investment calculus. Ten resident landlords were found. The number in this category increased over time; there were three resident landlords during the 1960's, and seven, during the 1970's.

Table 33

Resident Landlord Investors in German Village, 1960-1980

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Investor Type</td>
<td>n=9</td>
<td>n=11</td>
<td>n=20</td>
<td>n=23</td>
<td></td>
</tr>
<tr>
<td>Resident landlord</td>
<td>2 (22.2)</td>
<td>1 (0.1)</td>
<td>2 (10.0)</td>
<td>5 (21.7)</td>
<td>10 (100.0)</td>
</tr>
<tr>
<td>All other investors</td>
<td>7 (77.8)</td>
<td>10 (90.0)</td>
<td>18 (90.0)</td>
<td>18 (78.3)</td>
<td>53 (100.0)</td>
</tr>
</tbody>
</table>

The pattern of investing in one's own neighborhood suggests that owners viewed the area not only as a good investment but also as a desirable living environment. Such a pattern of investment can be seen as serving two functions. First, owners are able to exert some control over their environment by selection of tenants and decisions on amount, type, and timing of maintenance and rehabilitation. Second, investors are anticipating some type of contagion effect from their investment. In other words,
owners acted to protect their consumption as well as their investment interests. This pattern might be dubbed the "Pavey" effect, after the one-man neighborhood rehabilitation project in another Columbus neighborhood.

Multiple ownership by a significant number of German Village residents offers support for the importance of use-value as part of the investment calculus. Thus, more information on the extent of multi-ownership is needed. To pursue the existence of a use-value criterion for investment behavior, or "Pavey" effect, instances of multiple ownership were further investigated. The Franklin County Real Estate Atlas was used to collect names of owners of more than one German Village property in the year 1981. These names were then checked with records of the Franklin County Auditor to determine property holdings during the years 1950-1980. Twenty-one owners of sixty-five properties were identified; ten of the owners had already been identified in the random sample.

Of the "multi-owners", thirteen (61.9 percent) lived in German Village (number of properties per owner is shown in Table 34). German Village residents owned two-thirds of

(17) This refers to Dr. Pavey, who bought and rehabilitated the entire block surrounding his own residence in order to ensure a "nice" neighborhood.

(18) The Franklin County Real Estate Atlas lists all property owners in the county and the property each holds. The 1981 Atlas was used because earlier editions were not available.
these properties.

Table 34

Number of Properties Per Owner for Multi-Owners in German Village

<table>
<thead>
<tr>
<th>Properties Per Owner</th>
<th>Number of Owners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Place of Residence of Owner</td>
</tr>
<tr>
<td></td>
<td>German Village</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Total Properties</td>
<td>44</td>
</tr>
<tr>
<td>Total Owners</td>
<td>13</td>
</tr>
</tbody>
</table>

Investment with respect to number of properties and residence of owner is presented in Table 35. All German Village resident investors had invested at least $5000 in at least one of their properties or had bought properties already rehabilitated. In contrast, three of the eight non-resident multi-owners failed to reach this criterion. Eight resident owners had invested at least $10,000 in at least one of their properties; three of the non-resident group had invested at least $10,000. This table shows that thirty-five of the sixty-five properties were rehabilitated and that German Village resident owners were more active
than non-residents in investing in rehabilitation. German Village residents rehabilitated twenty-six of the thirty-two properties with investments of at least $5000. On the other hand, sixteen of the thirty properties not rehabilitated were owned by German Village residents.

Table 35

<table>
<thead>
<tr>
<th>Investor Residence</th>
<th>No Investment or less than $5000</th>
<th>$5000-9999</th>
<th>At Least $10,000</th>
<th>Rehabilitated before</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>German Village</td>
<td>16 (36.4)</td>
<td>14 (31.8)</td>
<td>12 (27.3)</td>
<td>2 (4.5)</td>
<td>44 (100.0)</td>
</tr>
<tr>
<td>Other</td>
<td>14 (66.7)</td>
<td>2 (9.5)</td>
<td>4 (19.0)</td>
<td>1 (4.8)</td>
<td>21 (100.0)</td>
</tr>
</tbody>
</table>

In summary, the importance of real estate professionals in creating a supply of rehabilitated properties is demonstrated by the number of real estate professionals investing in German Village, particularly during the 1960s. Use value was also found to be important in the investment calculus of a sizable number of German Village residents who invested not only in their own residence but also in other German Village property.
SUMMARY

The purpose of this chapter was to examine the gentrification process at three scales—in the urban area as a whole, within the inner city, and within the neighborhood itself. Gentrification is seen as made possible by shifts at the economic, political, and sociocultural levels. The transition from a manufacturing to a technical/service oriented economy has meant growth in managerial, technical, and professional employment. Along with these shifts in employment have come social changes, i.e., more women in the workforce, more single or two-earner households. These groups have a particular set of housing needs that seem to be better met by an inner city location (proximity to jobs, support groups, services, cultural amenities).

While the inner city is in demand for residential use by middle class households, however, not all central neighborhoods are equally favored. Three interrelated processes may serve to explain why some neighborhoods are gentrified and others are not. First, the characteristics of some neighborhoods, lower costs, higher quality, may be more amenable to investment. Public intervention may also be important in removing obstacles to investment or creating a more favorable investment climate. In addition, a random origin and contagion process seems important for the "take-off" of a neighborhood. In other words, gentrifica-
tion may receive its impetus from a series of real estate investment "mistakes" that are spatially and temporally confined so as to make them mutually cancelling.

Once gentrification starts in a neighborhood, who "keeps the ball rolling"? The focus of investigation here was the investor in rehabilitation of German Village property. Two patterns of investment were found—one the classical exchange value orientation and two, a greater orientation toward use value. On the one hand, landlords and real estate professionals, in particular, played an important role in German Village rehabilitation. Real estate professionals, for example, made one-third of the investment in rehabilitation during 1960-1965 and almost half of the investment during 1966-1970. Also of importance in German Village rehabilitation, however, was investment by residents and resident/landlords who may have been more motivated by "enjoyment of a renovated neighborhood" than by return on investment.
Chapter V

SUMMARY

The purpose of this study has been to address some of the "missing links" in our knowledge of gentrification. Four topics relating to the pattern and process of gentrification were explored: spatial pattern, the role of investors, explanation for location of gentrification, and the link between middle class rehabilitation and downtown office development. For the analysis of spatial and temporal patterns of gentrification, three scales were used: city/suburb contrasts; differentiation within the central city; and patterns of change within neighborhoods identified as gentrified.

The metropolitan area of Columbus, Ohio, was used as the study area. Columbus was selected on the one hand as an example of transition at the urban level to a service economy, and because Columbus is the center of state government, the location of administrative headquarters of several large corporations, and has a strong research base. Further, most of these functions or institutions are located in or near the central business district, testifying to
the development of the downtown as an office center. Columbus is also the location of two well-documented areas of gentrification, German Village and Victorian Village. These neighborhoods are located within one-and-one-half miles of the CBD, German Village directly to the south and Victorian Village, to the north.

Thus, analysis of data from the Columbus metropolitan area, from the inner city, and from individual properties in two inner-city neighborhoods served to provide answers to questions not addressed or left unanswered in the literature. Specifically, questions concerning the existence of a contagion effect within neighborhoods, changes in distribution of middle class population throughout the metropolitan area, the importance of real estate professionals in the investment process, the particular locations for gentrified neighborhoods, and the link between social and economic changes in the city and gentrification were addressed.

**SPATIAL AND TEMPORAL PATTERNS OF GENTRIFICATION**

Spatial and temporal patterns of gentrification were analyzed at three scales—the metropolitan area as a whole, the inner city, and the neighborhood.
Central city/suburb contrasts

With respect to changes at the level of the metropolitan area as a whole, models of the changing social geography of the metropolitan area were used to measure the distribution of absolute numbers as well as the proportion of middle class occupants throughout the metropolitan area. Two regression models with (1) density of white collar workers, and (2) white collar workers as a percentage of employed workers as a function of distance from the CBD were evaluated for 1950, 1960, 1970, and 1980.

This analysis of middle class residential pattern indicated increased middle class occupancy in the inner city throughout the three-decade period. Further, increases occurred in a relative sense, with the percentage of white collar workers in the inner city being greater in each successive period. The results for change in middle class density patterns, however, were not as clear. The density of middle class occupants within two miles of the CBD decreased between 1950 and 1960 but it did increase after 1960. Thus a general pattern of increased middle class occupancy in the inner city was revealed by census tract data.
Differentiation within the inner city

At the level of the inner city, the question was asked: have gentrified neighborhoods changed in ways different from non-gentrified neighborhoods? Examination revealed that neighborhoods identified as gentrified differed from non-gentrified areas with respect to homeownership rates, property values, and a variety of other socioeconomic characteristics.

Three types of analyses were performed. First, tests of significance of changes in ownership rates and property values were made. In addition, a regression analysis was performed to test the strength between increased property values and location in a gentrified neighborhood. Thirdly, a factor analysis of sixteen variables for eighteen inner-city neighborhoods was performed.

Homeownership rates generally increased in gentrified areas and decreased in non-gentrified areas, especially during the last decade. On the other hand, rates of homeownership declined in German Village during the 1960's, perhaps indicating more activity by non-resident investors in the early stages of gentrification. With respect to property values, differences between gentrified and non-gentrified areas were significant between 1970 and 1980.

In the regression analysis of property values as a function of value in the preceding decade and location in a
gentrified area, property value increases were greater in gentrified areas, particularly in German Village, than in non-gentrified areas. This analysis seemed to confirm a contagion effect over time, thus adding another dimension to the discussion of the agglomerative aspects of gentrification.

The contrast between gentrified and non-gentrified areas was further magnified when a set of sixteen social, economic, and housing characteristics for eighteen neighborhoods was analyzed. In a factor analysis, the two gentrified neighborhoods, German Village and Victorian Village, stood in dramatic contrast to other neighborhoods on a factor describing populations with high educational levels (four or more years college); large percentages of white collar workers, two or more workers per household, females employed in the labor force, population between the ages of thirty and forty-four; high per capita income; and high housing dollar-values.

Patterns of change within gentrified areas

To test the view that gentrification is spatially agglomerative within neighborhoods, two types of analysis at the level of the individual property were carried out. Quadrat count analysis was used in an attempt to establish that clustering was exhibited in the pattern of rehabilitation in both German Village and Victorian Village and that
clustering could have been brought about by a spatially agglomerative process. The second analysis, use of an algorithm designed to identify growth poles, was employed to establish that contagion could have proceeded from a few discrete points in the neighborhood.

In the German Village case, investment was found to be clustered and some support was found for diffusion from particular points. For Victorian Village, where gentrification did not take off until after 1970, investment patterns were strongly linear and more localized, particularly for investments of at least $10,000.

THE GENTRIFICATION PROCESS

Of clear importance to a study of gentrification is an examination of the process or processes producing its characteristic spatial and temporal patterns. The gentrification process was examined at three scales—the urban area as a whole, inner city, and neighborhood. This examination of process served three functions. First, analysis at the within-neighborhood level served to provide a base for argument against an individualistic, demand-led, characterization of the gentrification process. Second, study at the level of the inner city addressed the question of precise location of gentrification; and thirdly, analysis of changes in occupation and household composition was made to
situate the phenomenon within the urban process, i.e., with respect to broad social, economic, and physical changes in the urban area.

Gentrification and the "post-industrial" city

An understanding of the gentrification process must include the relation to broader changes at economic, political, and sociocultural levels and how these changes are reflected in metropolitan areas. Gentrification is seen as made possible by shifts at the economic, political, and sociocultural levels. The transition from a manufacturing to a technical/service oriented economy has meant growth in managerial, technical, and professional employment. Along with these shifts in employment have come social changes, i.e., more women in the workforce, more single-person or two-earner households. These groups have a particular set of housing needs that seem to be better met by a central city location (proximity to jobs, support groups, services, cultural amenities).

Changes in household composition and occupation of inner-city residents from 1950 through 1980 were documented. A general hypothesis was that residential changes in inner-city neighborhoods would mirror changes in inner-city employment, with the expectation that the number of single, white collar, CBD employees would have increased in gentrified areas. With respect to household composition, there
were striking declines in the number of widows and older people (as indicated by "retired" status) in gentrified neighborhoods (15.2 percent of the residents were widows in 1950; there were none in 1980). In addition, there were more white collar than blue collar workers residing in gentrified areas and no white collar workers residing in non-gentrified areas by 1980, although the data for this are suspect due to small sample size.

Thus these data seemed to indicate an association between gentrification and changes in the urban process. The shift toward more white collar jobs was reflected in the residential patterns of "preferred" inner-city neighborhoods. Changes at the sociocultural level were also evident—a shift in the population of gentrified areas toward younger households was observed.

Selection-out of gentrified neighborhoods

While demand for inner city housing by middle class households has increased, not all inner-city neighborhoods are equally favored. Three processes may serve to explain why the question of the selection-out of particular neighborhoods for gentrified neighborhoods for gentrification has been neglected. Thus, an interesting topic for study was offered.

Three processes may serve to explain why some neighborhoods are gentrified and others are not. First, the char-
acteristics of some neighborhoods, e.g., lower costs, higher quality, may be more amenable to investment. Public intervention may also be important in removing obstacles to investment or creating a more favorable investment climate. In addition, a random origin and contagion process seems important for the "take-off" of a neighborhood. In other words, gentrification may receive its impetus from a series of real estate investment "mistakes" that are spatially and temporally confined so as to make them mutually cancelling. These processes are, at a minimum, not mutually exclusive and may be interrelated. For example, government investments may also be of a random nature and so be mutually cancelling or mutually reinforcing. Or public intervention may follow private mistakes, when these mistakes are clustered and so become mutually cancelling.

In the case of German Village, for example, all three processes were evident. An important form of public support was the creation and operation of the German Village Commission, serving as an architectural control group and a lobby for public intervention favorable to German Village. Private investment was also quite important in German Village rehabilitation; and the random element possibly played a role in the initiation of investment. In addition, investors were possibly attracted by neighborhood characteristics noted above.
The real estate investment process

Investment in inner-city residential neighborhoods for middle class use is contingent upon a number of interrelated pre-conditions, including the rent gap, growth of a white collar labor force, and the concentration of a well-educated, white collar population group in large cities. Another pre-condition is a supply of inner-city housing of sufficient quality to be attractive to middle class residents. One aspect of the supply question, the activity of real estate professionals in gentrifying neighborhoods, was addressed.

The hypothesis that real estate professionals were the driving force, particularly in the early stages of gentrification, was evaluated. Records of property transactions, building permits, and occupation of owner were used in the analysis. Investments were grouped by time period and by amount and type of investor (real estate professional or not); length of ownership for each property was also determined. Thus differences between investor types could be established with respect to time and amount of investment and length of ownership.

In the sample of sixty-three rehabilitated German Village properties, over one-fourth were owned by real estate professionals. Almost half of the investment in rehabilitation during 1966-1970 was made by REP's. Thus, there
seemed to be support for the importance of real estate professionals in the gentrification process, particularly in the early stages.

On the other hand, however, there was also support for the importance of use value to investors in German Village rehabilitation. This support came in the number of "multi-owners" of German Village property. Just over sixty percent of owners of more than one property also lived in German Village. This suggests that these owners viewed the area not only as a good investment but also as a nice place to live, and one which they wanted to make nicer by the rehabilitation of the neighborhood.

CONCLUDING REMARKS

The results of this study lead to further questions concerning the gentrification process. For example, this study focused on owners who invested in rehabilitation of property, but questions concerning non-rehabbing owners are also of interest. Further analysis comparing the two groups is needed.

In addition, more work could be done to document activity of multi-owners of property in gentrified areas. Documentation of temporal and spatial pattern (e.g., location of properties with respect to one another) might provide greater insight into use value/exchange value considerations.
Finally, a third example of further research concerns the question of the location of gentrified neighborhoods within the inner city. More precise documentation of the timing and location of private and public investment in the inner city may provide greater understanding of the location of gentrification.
BIBLIOGRAPHY


34. Embry, Robert C., Jr. *Neighborhood Rehabilitation—The Baltimore Case*, in *Toward A National Urban Policy*. (Committee Print for Subcommittee on the City of the Committee on Banking, Finance and Urban Affairs, House
of Representatives, 95th Congress, 1st Session)  
1977, 77-82.

35. Fennesy, Tom. "Anywhere Else Wouldn't Do." The  

36. Firey, Walter. "Sentiment and Symbolism As Ecological  
Variables." American Sociological Review. 10 (1945),  
140-148.

37. Ford, Gerald R. Interim Report of The President's  
Committee on Urban Development and Neighborhood  
Revitalization: Statement by the President. October  

38. Ford, Kristina. Housing Policy and The Urban Middle  
Class. Rutgers: Center for Urban Policy Research,  
1978.

39. Ford, L.R. "Continuity and Change in Historic Cities:  
Bath, Chester, and Norwich." Geographical Review. 68  

40. Ford, L.R. "Perceptual Change and Urban Preservation."  

41. Ford, L. R. "Historic Preservation and the Sense of  

42. Ford, L. R. "Urban Preservation and the Geography of  
the City in the USA." Progress in Human Geography. 3  
(1979), 211-238.

43. Ford, L. R., and Fusch, R. "Historic Preservation and  
The Inner City: The Perception of German Village by  
Those Just Beyond." Proceedings, Association of  
American Geographers. 8 (1976), 110-114.

44. Freeman, Jo. "Women and Urban Policy." Signs. 5  
(1980), S4-S21.


46. Gale, Dennis E. "Middle Class Resettlement in Older  
Urban Neighborhoods." Journal of the American Planning  
Association. 45 (1979) 293-304.


92. Westmoreland, Carl B. Statement Before the Committee on Banking, Housing, and Urban Affairs of the U.S. Senate, in Neighborhood Diversity. Hearings Before the Committee on Banking, Housing, and Urban Affairs, U.S. Senate, 95th Congress, 1st Sess., 1977.
