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The Role of Race in the Perpetuation of Inadequate Housing

William H. Dozier
Western Michigan University

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by

William H. Dozier

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THE ROLE OF RACE IN THE PERPETUATION OF INADEQUATE HOUSING

William H. Dozier, Ph.D.

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The purpose of this study was to examine the influence of race as a factor in the perpetuation of inadequate housing in the United States. The idea is not that race causes poor housing conditions, but rather, that housing units occupied by Black households are less likely to be repaired than those occupied by white households. Literature suggests that several institutionalized factors may place unit repair beyond the ability of the renting or owning household. Using data collected through the American Housing Survey (AHS), perpetuation of inadequate housing was measured from 1987 to 1991. The research investigated 2,139 units that were defined as inadequate in 1987 and evaluated their condition in 1991. Several independent variables, in addition to race, were included in a multivariate analysis as control variables to assess the impact of race in the perpetuation of inadequate housing. The disproportionate representation of Black households associated with poor housing quality supports the examination of race as a key independent variable. The research found support for the hypothesis that inadequate housing units in 1987 that were occupied by Black households in 1987 and also in 1991 were more likely to be inadequate in 1991 than those occupied by White households in both time periods. Inadequate units

in 1987 occupied by Black households had proportionally more deficient conditions and more severe conditions than inadequate units occupied by White households. The level of inadequacy of a unit in 1987 also contributed to the continuance of inadequacy in 1991; units with higher levels of deficiencies were less likely to be repaired.

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CHAPTER I

INTRODUCTION

The purpose of this study is to examine the role of race in the perpetuation of inadequate housing in the United States. This longitudinal study focuses on the key variables of the race of the residing household and the inadequacy of the dwelling. The dwelling is the unit of analysis. Obviously, the idea is not that race causes poor housing conditions. Rather it is that housing units occupied by Black households are less likely to be repaired than those occupied by White households. While the deficiency of these units could be attributed to various reasons, it is expected that several institutionalized factors may place unit repair beyond the ability of the renting or owning householder.

Using data collected through the American Housing Survey (AHS), perpetuation is measured over the time period between January of 1987 and December of 1991 (Hadden & Leger, 1990). The study focuses on units that were defined as inadequate in 1987 and evaluates their condition in 1991. Several independent variables, in addition to race, are included in the multivariate analysis to assess determinants of housing conditions and the perpetuation of inadequate housing.

This study is concerned with the research question: Does race contribute to the continuance of inadequate housing? It is concep-

tualized that inadequate housing units occupied by Black houscholds in both the 1987 and 1991 samples will be more likely to remain inadequate than similar units occupied by White households. This study tests the hypothesis that inadequate housing units in 1987 that were occupied by Black households in 1987 and also in 1991 are more likely to be inadequate in 1991 than those occupied by white households in both time periods.

In addition to an examination of indicators of housing quality, an expanded version of the AHS inadequacy measure is created to provide an added tool for understanding the perpetuation of inadequate housing. The role of race is then evaluated with the expanded measure to assess the changes in housing quality over the four-year period.

This study specifically relates to HUD's commitment to reducing the separations by race and income in American life. The disproportionate representation of Black households associated with poor housing quality supports the examination of race as the major independent variable. Although other racial groups also live in poor quality housing, Blacks comprise the largest single racial minority group in the nation and are the most likely to live in inadequate housing.

CHAPTER II

REVIEW OF LITERATURE

The History of Housing Surveys

The Census of Housing in 1940 was the first national examination of US housing quality (Hanna, 1985). Since then, subsequent decennial censuses of housing have been modified to address improvements in the understanding of housing conditions and preferences. While improvements have been made, these modifications have also complicated longitudinal comparisons of housing quality. Older items were removed from the instrument, and items deemed more productive in improving the understanding of housing conditions were added. Nevertheless, some indicators that allow a limited analysis of housing quality have been constant in Federal housing data. Similar to early data, recent data have an indicator of housing quality included within the survey.

There have been several modifications in the collection of housing data. The 1940 Census included only limited data on the structural features of units. The changes began with the 1950 Census of Housing, which increased the information provided on housing quality. The Committee on Housing Adequacy changed the 1950 Census of Housing, adding indicators of health and safety. For the 1950 Census, either the presence of a single major adverse indicator or a combination of minor indicators resulted in the labeling of a unit

as inadequate.

Change continued with the 1960 Census of Housing. It replaced the single category of inadequate quality with two categories (moderately inadequate and severely inadequate). The earlier versions considered units either adequate or inadequate. In the 1960 Census, therefore, the attempt was made to recognize an intermediate level of housing adequacy to identify units that needed more than routine maintenance. The 1970 Census, discontinued the determination of adequacy for housing, but continued to collect information on other features of housing quality such as plumbing. The function of collecting data on housing quality was taken on by The Annual Housing Survey.

During the early seventies the Annual Housing Survey (AHS), became the preeminent source of housing data. The AHS was a product of what is currently the Department of Housing and Urban Development (HUD), and was designed to focus more on housing conditions. In addition to providing an improved view of US housing quality, the AHS required extensive interviews of residents to use their perspectives and experiences to give detailed and historical information that could not be provided by an enumerator. There were advantages and disadvantages in the AHS's allowing the householder to evaluate the housing conditions. Evaluations were not as detailed in terms of dilapidation as were those of enumerators' inspections. However, household evaluations allowed a broader picture of housing conditions. Households provided numbers not available to enumer-

ators, such as the length and number of breakdowns of various systems. The AHS provided a considerably clearer picture of the housing stock than Census efforts.

Why Study Housing Quality

The impact of housing quality for the health and safety of occupants was the foundation of housing concerns. Beginning in the late nineteenth century and continuing well into the 1930s, housing policy focused almost exclusively on quality (Hays, 1995). Early housing policies were almost exclusively municipal in origin and administration (Goering, 1986). These policy makers were interested in unsafe and unhealthy housing for an enlarging urban population (Stave, 1977). Health and fire officials were concerned for the immediate well being of the urban dweller (Ward, 1989; Wood, 1970). In addition to safety, the transmission of disease was also a concern for many of these officials (Burns & Grebler, 1977; Pink, 1974).

Bronchitis, chorea, profuse expectoration, and tuberculosis were common in early urban cities (Ward, 1989; Woods, 1970). In the view of housing officials, these diseases and illnesses were believed to be transmitted through poor sanitation and bad air, which in turn was attributed to the lack of inside plumbing. At the turn of the century, few units had hot and cold running water or indoor toilets. The second concern was fire safety. Many of the fire deaths could be attributed to the heating and lighting systems

(Goering & Coulibably 1989). Therefore, the focus on housing was generally on remedying these conditions. Local housing codes were used to force owners to provide what was considered safe and healthy housing (Goering & Coulibably 1989).

These local efforts improved housing quality for thousands of households. However, early US federal policy was more influential in breath and depth. Specifically, the initial three federal Housing Acts were influential in the improvement of aggregate US housing conditions (Orfield, 1974). First was the Housing Act of 1934 which firmly positioned housing on the federal agenda. With the 1934 act, the federal government made an official commitment to US housing. The 1934 act was preceded by the creation of the Federal Home Loan Bank system in 1932 and the Homeowners' Loan Corporation in 1933 (Wendt, 1962). Yet in the aftermath of the depression it was the Housing Act of 1934 that produced the Federal Housing Administration (FHA).

The collapse of the private housing market during the depression pulled the government into the housing market and led to the creation of the Federal Housing Administration (FHA) as part of the New Deal (Gottdiener, 1994). The FHA was created primarily to insure residential mortgages on private dwellings against individual borrower default, and did so under "Section 203" of the 1934 act. The FHA insurance eliminated the lender's risk in providing mortgages for home purchasers meeting FHA standards of market value and quality (Gottdiener, 1994). Also, the FHA established housing as a

federal priority with the creation of a federal department to administer governmental goals (Glazer & Bias, 1980).

The 1937 Housing Act elevated the federal commitment to US housing by establishing goals to improve housing quality. These goals were clearly set forth in the Housing Act of 1937. The act set a distinct agenda of decent, safe, and healthy housing (Friedman & Weinberg, 1983). The 1934 and 1937 Housing Acts were followed by the 1949 Housing Act, which considered fair housing to be an added goal (Goering, 1986). Although federal housing efforts did not reduce actual unit deterioration (Teitz & Rosenthal, 1971), these legislative acts resulted in the statistical improvement of the aggregate US level of housing quality relative to previous levels by supporting the construction of new housing and the demolition of deteriorating housing (Bellush & Hausknecht, 1980). Therefore, the federal efforts were generally reactive versus proactive in terms of improving the level of housing quality.

These legislative acts improved the aggregate level of housing quality largely by authorizing two, supply-oriented goals. First, they created support for home loans. Such loans assisted in the purchase of high-quality housing, generally newly built suburban units. These efforts also resulted in the construction of high-rise apartments for the poor (Feagin & Parker, 1990). Each new unit introduced to the housing stock raised the aggregate level of housing quality (Yinger, 1987; Weicher, 1980; Otto, Eastman, & Huan, 1974). Second, and more effective at improving the aggregate level of hous-

ing quality, was the demolition of lower quality housing (Bell & Kelso, 1986; Hirsch, 1983). Each unit demolished also raised the aggregate level of housing quality (Bellush & Hauskneght, 1980). Entire neighborhoods of unsafe or unsightly units were demolished (Hirsch, 1983). These improvements in the aggregate housing level of quality have led to a debate centered on the question: has enough been done to improve housing quality?

The Importance of Quality

The success of efforts in the improvement of housing quality has led many housing scholars to argue that inadequacy is no longer a problem (Weicher, 1989; Burt, 1992). These scholars suggest that nearly all units meet the minimum housing quality standards of the AHS, and that affordability and segregation are far more pervasive problems today in terms of the numbers of people affected (Weicher, 1989; Burt, 1992).

Affordability affects almost half of all renters (Stone, 1994), and eliminates two thirds of potential home buyers (Joint Center for Housing Studies of Harvard University, 1993). Less than a third (31.7%) of young renters can afford to make the standard down payment necessary to move into homeownership (Joint Center for Housing Studies of Harvard University, 1993). At the same time, over half of all renters pay more than 25% of their incomes for rent (Stone, 1994). Also, about 30% (30.8%) of all renter income goes toward rent (Joint Center for Housing Studies of Harvard University, 1993).

The financial strain is magnified for those 4.8 million people who pay over half of their income for rent (Lederman, 1993). This is in addition to the estimated 2 million people who are homeless. These factors have combined to create an affordability crisis in the US housing market.

In addition to the magnitude of the affordability problem, racial segregation remains pervasive in the US housing market. Segregation was found to be only slightly less for Blacks when earlier indexes were compared to those of the 1970s or the 1980s (Turner, 1992; Van Valey, 1977). In addition, Massey and Denton, (1993) found an average dissimilarity index score of 66.8 for Blacks in their research of major cities, based on the 1990 census. This score indicates that over two thirds of the Blacks in these areas are segregated. There is also evidence that suggests that reductions in segregation scores are either largely statistical or temporary. For example, Farley's research using 1988 data suggests that what appears to be a reduction in segregation is actually the result of the inclusion of neighborhoods with White flight in progress in the computation of the dissimilarity indexes (Farley, 1991).

It is unreasonable to suggest that housing quality currently affects more people or does more damage than either affordability or segregation. Therefore, this study recognizes both segregation and affordability as major determinants of housing quality. It is, however, also, unreasonable to ignore the fact that millions of people live in unsafe or unhealthy housing (Joint Center for Housing Stu-

dies of Harvard University, 1993; Apgar, 1989). An analysis of 1991 AHS data showed that over 9 million people live in inadequate housing. Also, focusing on construction and demolition changes in housing quality tends to neglect the fact that the actual aggregate number of inadequate housing units has increased, according to current AHS definitions (Apgar, 1989). Therefore, inadequate housing is a legitimate and pervasive condition in the US housing stock (Joint Center for Housing Studies of Harvard University, 1993). The goal of this research is to return attention to poor housing quality and to those who live in such conditions.

The Definition of Inadequacy

The definition of inadequacy is, of course, a subjective determination (Momeni, 1987). Moreover, the value judgments involved in determining which conditions or combinations of conditions are used to label a unit as inadequate have changed over time (Weicher, 1989). Weicher argued that some units labeled inadequate were actually adequate. He also used AHS data to support the contention that housing quality may be higher than AHS data suggested. Weicher appears to suggest that housing scholars and officials should be satisfied with complete plumbing and kitchen facilities as measures of adequacy. In his view, inadequate numbers were inflated by the redefinition and inclusion of other conditions that were used to determine housing quality. Weicher specifically explains that 75% of the units labeled as inadequate housing in Dallas

were attributed to what he considers a common southern practice of using unvented space heaters. Such an analysis does ignore the potential carbon monoxide poisoning connected to using unvented space heaters, while implicitly placing the blame for the health and safety risk on southern culture.

Today's housing scholars and officials are aware of many hazards that their predecessors failed to consider or never imagined were potentially dangerous. For this reason, the AHS quality index has been changed periodically to reflect the advancements in knowledge and technology. Yet, the reality is that current AHS minimum quality standards potentially overlook millions of people who live in unsafe or unhealthy housing. Some housing scholars would like many items added to the AHS to clarify the housing picture (Stegman, 1992). Two popular reasons for not increasing the number of items included in the AHS are the reliability and the cost of measurement. Regardless of why these hazards are not measured, it could be legitimately argued that conditions may actually be worse than suggested by AHS data.

AHS data, which are the most comprehensive housing data source, do not consider household pests, dust, carbon monoxide, radon, the availability of fire extinguishers, or smoke alarms. Current scholars are aware of these hazards and are also aware of diseases that household pests spread in housing. For example, roaches spread coliforms, salmonella, staphylococcus, and other microbes that cause food-borne diseases. In addition, approximately 5% of the popula-

tion are allergic to roaches (Blum, 1995). Resultant illnesses cost millions of lost work and school days and lead to long-term health problems and even deaths. However the AHS does not question respondents about pest infestations.

Another example is the issue of carbon monoxide as a housing hazard, which is ignored in the AHS data. Carbon monoxide (CO) is a odorless, colorless, and tasteless gas which is produced in dangerous levels by improper ventilation of fire sources. Annually, CO poisoning (which is the leading cause of accidental poisoning deaths) annually kills over 1,500 people and injures 10, 000 more people. These deaths and injures are not restricted to older units. Newer, airtight, energy efficient homes without air exchangers are also likely to be dangerous.

Radon gas is also a danger not considered in the AHS. It is estimated that 13,000 lung cancer deaths yearly are attributable to this colorless, odorless, tasteless, and radioactive gas (US Geological Survey, 1996). Although those households in coastal states and those states that are or were the site of larger bodies of water are at higher risk, other homes could have dangerous levels of radon.

Reiterating the earlier suggestion that the health and safety of the population are the foundation of housing quality standards, to ignore developing information on housing safety and hazards is to ignore the fundamental goals for housing standards. For example, the absence of smoke alarms is a housing code violation in most communities. Current knowledge and technology provide an awareness of

dangers in the dwelling unit greater than that of early scholars and officials. Therefore, periodical updating of quality standards is necessary.

Affordability

Although affordability and housing quality are considered separately in this study, the former is generally investigated as a determinant of the latter. In the past decade and a half, the reduction in the availability of low-cost housing has forced many households to become more willing to accept lower quality housing (Joint Center for Housing Studies of Harvard University, 1993). The literature provides statistics highlighting the extent of the affordability crisis. It also is filled with demographic trends that have contributed to current conditions (Burt, 1992; Stegman, 1992; Joint Center for Housing Studies of Harvard University, 1993; Nenno, 1991).

The literature suggests that the demand for low-cost housing has recently created an economic environment in which households are increasingly accepting of poorer quality housing. Factors such as demographic changes, shifts in the economy, housing market changes, reduced levels of assistance, and a reduced housing inventory have contributed to the increased US housing burden (Nenno, 1991). According to Bellush and Hauskneght (1980), government programs which funded the construction of the suburbs were carried out at the expense of inner-city rehabilitation. Bellush and Hauskneght (1980)

suggested that the dollars that were allocated to provide infrastructure and loans could have been spent on the inner-city. Yet even more importantly, governmental funding reduced the cost (economic and time) of moving to the suburbs. This assisted higher income households in abandoning the inner-city, thereby stripping inner-cities of a considerable portion of tax income. In addition, it also moved consumers from inner-city retailers. Furthermore, in economic terms, as real income has decreased, the cost of housing has increased and the demand for low-cost housing has increased (Apgar, 1989; Weicher, 1989; Joint Center for Housing Studies of Harvard University, 1993). During the last decade, for example, poverty increased 41% (Burt, 1992), placing over a million additional low income renters in the housing market (Stegman, 1992). In addition, more than half of all renters pay between a quarter and a half of their incomes for rent (Joint Center for Housing Studies of Harvard University, 1993). Of those with extremely low incomes, 70% paid over half of their income for housing. Furthermore, housing units have been removed from the housing stock at a faster rate than new construction has been built (Joint Center for Housing Studies of Harvard University, 1993).

Filtration, which has been the primary approach to supplying housing to poor citizens in the US has been unable to meet recent demand. The expectation, in filtration theory, is that as the upper economic sub-market moves into higher quality housing, the subsequent economic sub-market group will move into the former's vacated

housing. For each subsequent economic sub-market, filtration produces improved housing conditions. Filtration continues until those at the bottom of the economic scale have improved their housing conditions (Glaster & Rothenberg, 1991; Weicher, 1989). Filtration is similar to human ecological theory in that it also has an expectation of succession. However, filtration replaces ecology's concentric zones and culture with price indexes and market factors as the determinants of housing composition (Glaster & Rothenberg, 1991; Schwab, 1987). Theoretically, the poor sub-market would eventually move into the former homes of the wealthy (Weicher, 1989).

The aforementioned conditions and others have contributed to filtration's failure to meet the lower income housing demand. In addition to these conditions, without major expenditures, 15% of the current public housing stock is in danger of being lost. Considerably more is in need of major renovations (Schnare, 1991).

Excessive rent burdens have also led to fewer middle class renters becoming homeowners (Joint Center for Housing Studies of Harvard University, 1993). The inability of many middle income renters to purchase homes has delayed the progression of lower-income households succeeding into those areas currently occupied by middle income households. Thus, the inability of middle-income households to move to newer housing constricts the availability of relatively higher quality housing for lower-income households. The middle class plight further restricts the options of Black households, who usually succeed White households into neighborhoods (Clay, 1979).

Racial filtration mirrors income filtration, with race replacing income as the major factor of demographic change. In racial filtration theory, the White sub-market moves into higher quality housing and the Black sub-market moves into that housing previously restricted to Whites which is relatively higher quality housing for the new residents (Galster & Rothenberg, 1991; Weicher, 1989). Racial filtration may be a step in economic filtration or it may be the catalyst of economic filtration (i.e., block busting).

In addition, federal and state demand housing programs serve less than half of the poorest citizens. States have reduced budget expenditures usually by decreasing the funds given to the poor (Stegman, 1992). In many states, a full Aid For Dependent Children grant is less than the average rent for a two bedroom apartment or house (Stegman, 1992). These factors have further increased the demand for low-cost housing, which has increased the acceptance of lower quality housing (Apgar, 1989; Weicher, 1989; Downs, 1992; Joint Center for Housing Studies of Harvard University, 1993).

In spite of the increased housing burden, housing costs have continued to increase. Real rents increased 175% between 1974 and 1991, while real incomes fell. Construction costs and new home prices have also increased (Joint Center for Housing Studies of Harvard University, 1993). Upper income households have bid up new housing prices, which are now well over a hundred thousand dollars. Further increasing the demand for low-cost housing was the reduction in real aggregate income. US industry has moved from a higher

paying manufacturing-dominated economy to a lower paying service sector dominated economy. The jobs available to young households fail to provide sufficient incomes to purchase homes or rent high-quality units.

While the need for low income housing has increased, the market has failed to make higher quality housing available through filtering. Therefore, some housing, which would normally have been removed, has remained within the housing stock. If rental households are unable to afford to pay the market rents, one of two things must happen. Either the lowest of income renters become homeless or the landlords reduce their expenses to maintain profits. In the latter instance, the result is lowering the unit's quality (Teitz & Rosenthal, 1971). A landlord may reduce expenses in only one area: maintenance (Teitz & Rosenthal, 1971). Therefore, some poor households are given market options of no housing or poor housing. For poor homeowners the situation is similar. Due to rising costs, they are often forced to reduce the maintenance of their homes or sell their homes and enter the rental market.

Race and Affordability

Affordability affects the poor most, and Blacks are more likely to be poor. Black households have lower incomes than White households on the average (Galster & Hoopes, 1993; Leven & Sykuta, 1994). Similarly, proportionately more Black households than White households live in poor quality housing (Joint Center for Housing

Studies of Harvard University, 1993; Galster, 1991; Muth, 1980). In 1991, of those households with 25% to 50% of the median income, Blacks were nearly twice as likely to live in inadequate housing (23% of Black households compared to 13% of White households) (Joint Center for Housing Studies of Harvard University, 1993). Blacks were also more likely to live in one of the approximately 1.4 million public housing units (Weicher, 1980) which were found to be in worse physical condition than privately owned subsidized housing (Newman & Schnare, 1993). Whites, in contrast, are more likely to live in privately owned subsidized housing (Warren, 1986). Although Black households are more inclined to apply for housing assistance, they are less likely to find adequate housing when using demand-oriented housing programs (Newman & Schnare, 1993). Therefore, the affordability crisis exacerbates the quality level of housing available to Blacks.

In addition to the above reasons for increased demand for low cost housing, there are also the restrictions that racial segregation and discrimination impose on the housing search for Black households. Recent research has indicated that although affordability was a factor in housing searches, discrimination was the major factor that restricted Blacks to lower quality housing (Rosenbaum, 1994).

Segregation and Discrimination

A review of the segregation and discrimination literature

also supports the use of race as the major independent variable in this study. The disproportionate representation of Black households in the demographic categories that research has correlated with poor housing conditions supports the examination of race as the major independent variable (Crull, 1994; Spain, 1990). While other minorities have problems with housing quality, Blacks comprise the largest minority group in the nation and contain the highest percentage of their group below the poverty line (Massey & Denton, 1993).

A review of the housing literature supports the comparison of Black households with White households. Blacks suffer the greatest housing segregation of any minority group in the country (Massey & Denton, 1993; Massey, Condran, & Denton, 1987). Segregation and discrimination affect the housing conditions of Black households in a variety of ways. One reason is that White flight continues (Wood & Lee, 1991), although the vast majority of Black households currently reside within formerly closed suburban areas (Schill & Wachter, 1995; Galster, 1991b). According to Rothman (1980), approximately half (48%) of the Blacks in his 1980 study experienced discrimination when attempting to purchase a home. Discrimination was even more prevalent for renters, in that 72% of the Black households experienced restricted accessibility (Clay, 1989). Also, Black households are more likely to experience discrimination for non-racial reasons than Whites (e.g., having children) (Weisbrod & Vidal, 1981). Often, housing discrimination leads to Black households paying more for housing conditions similar to their White counter-

parts (Yinger, 1987).

In addition to lower quality housing, segregation adversely affects economic opportunities, education, health care, and life expectancy for Blacks (Rosenbaum, 1994; Galster & Killen, 1995). According to spatial mismatch theory, Blacks experience latent economic consequences resulting from segregation (Rosenbaum, 1994; Kain, 1992; Massey et al., 1987). Segregation also lowers the educational opportunities for Blacks (England, Meier, & Fraga, 1988). Predominately Black schools have fewer resources, less experienced teachers, and more of the social phenomena that negatively affect the educational process than predominately White schools. Segregation also results in poorer health care for Blacks (Willis, 1989; Massey et al., 1987). There are fewer doctors and hospitals in segregated Black areas in comparison to those inhabited by Whites. Furthermore, the poorer health care associated with high levels of segregation lowers Blacks' life expectancy (Wilson, 1987; Massey & Denton, 1993).

Actors in the Housing Market

There are several institutions which contribute to segregation and also to the deterioration of housing quality. While realtors and bankers are scrutinized for their discriminatory practices, they are rarely penalized. Appraisers and insurers are rarely credited for the damage that they inflict on the housing market.

Real estate agents' discrimination methods manifest themselves

in various fashions which affect Black households. Racial steering remains a factor in the housing search (Turner, 1992). Data from the Home Mortgage Disclosure Act (HMDA), Housing Market Practices Survey (HMPS), and Housing Discrimination Survey (HDS) indicated that over half of Black housing seekers (otherwise demographically similar to Whites) experienced discrimination (Turner, 1992). Blacks were shown fewer units than Whites by agents when taken to White neighborhoods (Canner & Smith, 1991). One disturbing product of the HMDA data was that for example Blacks were usually unaware that they had been victims of discrimination until their experiences were compared to those of Whites (Canner & Smith, 1991).

Realtors use racial segregation to stimulate housing transactions (i.e., blockbusting) and improve their profits. Brokers also discriminate in advertising with the help of newspapers. Real estate advertisers segregate advertisements for units by race. Many metropolitan newspapers offer different classified sections for each neighborhood in the same edition. Therefore, newspapers sold in Black neighborhoods exclusively carry advertisements for units located in those areas. The reverse is true for White neighborhoods (Wienk, 1992).

Appraisers are inherently tied to mortgagors and real estate agents, and have done considerable damage to Black housing opportunities (Wienk, 1992). Appraisers, through racially motivated appraisals, create and legitimize the low values placed on potential Black occupied homes (Wienk, 1992). Decreasing home assessments

were primarily responsible for disinvestment in neighborhoods, which in turn, have been associated with lower quality housing. Landlords and homeowners disproportionately are held accountable for the deterioration of housing within neighborhoods with Black households, while the appraisal industry members avoid condemnation for their role.

Low appraisals also affect reinvestment decisions much more than landlord avarice and owner indifference. Property owners generally base their investment decisions on the potential for economic return. For homeowners and landlords, houses are considerable investments. Investing ten to twenty thousand dollars in renovating a unit with a ten thousand dollar appraisal value would be an unwise investment.

In addition, insurance redlining prevents landlords from insuring renovated properties at their renovated value (Wienk, 1992). Insurance companies redline certain neighborhoods and refuse to provide coverage to residents with the area. Also when forced to provide coverage in redlined areas, the industry sets maximum coverage to the market value of the property. Since the appraised value, and not the replacement value, is what a landlord would receive if fire burned the unit, the resultant disincentives for investments in segregated housing stock support the hypothesis that race is a major of housing quality determinant.

Financial institutions also discriminate against Black households (Kim & Squires, 1995; Rothman, 1980). Owners tend to live in

better housing conditions than do renters, and Blacks are disproportionately renters (Apgar, 1989). After decades of fair housing laws, there has been virtually no change in the difference between Black and White rates of homeownership (Kushner, 1992; Turner, 1992). White homeownership rates remain 20% higher than those of Blacks. Moreover 19% of this difference can be directly explained by race (Wachter & Megbolugbe, 1992). Home loan rejection rates are higher for Blacks when compared to Whites, even with controls for other characteristics (Kim & Squires, 1995; Ambrose, Hughes & Simmons, 1995; Canner & Gabriel, 1992). Even those Black households who do manage to obtain home loans typically pay higher rates than Whites (Wienk, 1992).

Mortgage redlining, although illegal, continues to curtail Black homeownership rates (Wienk, 1992; Rothman, 1980). Research indicated that frustration with mortgage lenders may have contributed to falling application rates for Blacks, which are considerably lower than those of Whites (Kim & Squires, 1995). Redlining also adversely affects attempts by landlords to procure home repair financing and new construction loans in depressed areas.

Current private mortgage redlining has its roots in the FHA. FHA redlining, based on the department's appraisal standards, saw units within inner city or nonwhite or racially mixed neighborhoods as unsound investments (Lief & Goering, 1985). The real estate industry lowered real estate values of any neighborhood upon the entry of Black households since the turn of the century. To a significant

extent, the minority class of inner city renters was created by this policy (Orfield, 1974). Furthermore, the injuries inflicted by the policies resulting from the 1934 Housing Act still affect Blacks economically in that home equity often constitutes the majority of a family's wealth (Gatzlaff, 1995; Stegman, 1992).

Blacks and Federal Housing

In addition to the FHA, the National Association of Real Estate Boards (NAREB) saw mortgages in racially mixed neighborhoods as poor investments (Feagin, 1990; Goering, 1986). This policy was supported by the theory of human ecologists beginning with Park and Burgess and still is supported by neoclassical ecologists (Eitzen, 1995). During the 1930s, after the Chicago race riots, Thorsten Sellin's cultural conflict theory (which was based on human ecology's principles) was the dominant theoretical influence for government housing policy. Thus, with the scientific backing of the University of Chicago, this federal government department mandated that each deed in every neighborhood with a unit insured by the FHA had to include a covenant restricting racial mixing (Lief & Goering, 1985). It is important to understand that the FHA was not making loans. However, it was insuring two-thirds of the mortgages made by a recently failed banking industry (Weicher, 1980).

The policies of the 1934 Housing Act were clearly helpful for middle class Whites (those who could get a mortgage) and counterproductive for Blacks. First, most US mortgages were insured by the

FHA, and over two-thirds of these were to White suburbanites (Weicher, 1980). Beyond the resulting segregation, these policies produced institutional racism in the banking system and thousands of vacant housing units in the central cities.

The primary objectives of the Housing Act of 1949 were first, to remove the urban structures classified as deficient, and second to improve the housing conditions of minorities excluded from earlier government efforts (Wood, 1982; Bellush & Hauskneght, 1980; Goering, 1986). Therefore, the government tore down structures it felt were unsightly or unsafe, often without providing or offering the residents similar or better places to live. Although the aims of the 1949 housing Act were well intentioned (in terms of racial equality in housing quality), its byproducts were not in the long term best interests of those whose lives it was intended to assist.

Displacement of the poor was one of the primary products of urban renewal. Furthermore, Blacks were more likely than Whites to be displaced by urban renewal, which was mandated by the Housing Act of 1949 (Wood, 1982; Bellush & Hauskneght, 1980). Indeed, it has been suggested that urban renewal was used by local politicians to move poor minorities out of the way of more desirable middle class White residents and White businesses (who could pay higher taxes and vote for White political candidates) (Orfield, 1974). Urban renewal resulted in a growing number of Blacks being relocated into more concentrated (Lief & Goering, 1985) and more impoverished areas such as public housing (Bauman, 1991).

This displacement has had long term negative consequences for Blacks and the urban environment. Long after urban renewal officially ended, over 370,000 urban households were being dislocated by local governments and private redevelopment on an annual basis (Feagin, 1990). These displacements constantly increased the demand for low cost housing. However, neither public nor private sector housing markets provided enough units for poor urban residents (Joint Center for Housing Studies of Harvard University, 1993).

In addition to the FHA refusing to insure mortgages in Black neighborhoods, Black homeowners were disproportionately forced to relocate as a result of urban renewal (Friedman, 1966, 1980). Neighborhood ties were lost in the relocation process. Many strong, stable, Black neighborhoods were destroyed because they were unsightly to those in charge, or in the name of superhighway construction that opened the suburbs for central city employees (Bell & Kelso, 1986). This destruction was done in the name of progress, even though it was not progressive for Blacks (Anderson, 1964). Moreover, when Black homeowners were compensated for their property, it was typically insufficient for home purchases outside the ghetto. Fair market value for a ghetto house would only buy another house in the ghetto. An additional problem for Blacks was that they usually paid more than fair market value for the homes in the ghetto. So they were often forced to move to a house with a higher mortgage than their compensation for the original unit.

The role of public housing in the solidification of segrega-

tion cannot be overstated (Goering & Coulibably, 1989; Massey & Bickford, 1991). Removal of housing officially defined as slums eliminated most of the affordable housing. With fewer choices, public housing seemed to be a very desirable alternative for low income Blacks. In addition, public housing lists were segregated for Blacks and Whites. Therefore, public housing practices were just as segregationist as the FHA mortgages (Orfield, 1974). The practice of using separate public housing lists for poor Blacks and poor Whites continued into the seventies (Lief & Goering, 1985). This practice slowed integration in two ways. First, it stopped poor Blacks and Whites from living together in poverty. Second, segregated public housing perpetuated housing segregation because these policies reproduced the conditions outside the public housing structures. Black projects were generally located in Black neighborhoods, and White projects were located in White neighborhoods. Therefore, the environments around the projects were just as segregated as those within the projects.

After considerable social and economic damage had been done to Blacks by the federal programs discussed above, fair housing programs began to address segregation and housing discrimination. Federal Fair Housing efforts have attempted to the reduce segregation in the US (Massey & Gross, 1991). However, these efforts have been ineffectual, when considering their potential.

Federal enforcement of fair housing laws have been hindered in two ways. They have traditionally lacked enforcement or scope (Kush-

ner, 1992). First, the consequences are not punitive enough to deter discrimination. Enforcement is also hindered by the procedures necessary to prosecute (Wienk, 1992). Second, the scope of federal fair housing is compromised by a variety of loopholes (Kushner, 1992).

Local governmental efforts to improve housing quality through housing code enforcement have had positive as well as negative consequences. The effect of code enforcement on housing quality has been the subject of several studies (Teitz & Rosenthal, 1971; Kiefer, 1980; Meier, 1983). While research has found code enforcement to improve housing quality, it has also had a negative impact on the availability of low-cost housing. Indeed, these studies found that code enforcement actually accelerates the removal of low-income housing units from the available stock (Teitz & Rosenthal, 1971; Kiefer, 1980; Meier, 1983).

Research also indicates that the amounts of rent paid in the lower income areas were insufficient to justify the necessary expenditures to maintain these units within code when considering the potential return (Teitz & Rosenthal, 1971; Kiefer, 1980; Meier, 1983). These units thus suffered the effects of the earlier mentioned low appraisals, realtor discrimination, discriminatory practices of financial institutions, and the income limitations of the poor (Lief & Goering, 1985, 1995; Ambrose et al., 1995; Canner & Gabriel, 1992; Kushner, 1992; Kim & Squires, 1995; Rothman, 1980; Wienk, 1992; Canner & Smith, 1992; Turner, 1992; Apgar, 1989; Wach-

ter & Megbolugbe, 1992; Orfield, 1974; Gatzlaff, 1995; Goering, 1986). Therefore code enforcement has a long-term negative impact on housing opportunities for the poor, while having positive consequences for their middle and upper income counterparts (Teitz & Rosenthal, 1971; Kiefer, 1980; Meier, 1983).

Housing Quality Research

Research indicates that housing quality has steadily improved over the last half century. In 1940, almost half of the housing was inadequate; by 1970, 95% of US housing was considered adequate (Weicher, 1989). During this period, real income has grown and the distribution of that income has been spread more evenly, which has raised the standard of living for most of the citizenry. Subsequent to the post depression up turn, the people have increasingly been able to afford higher quality housing. In addition, advanced construction methods and materials have increased affordability. However, by the early eighties, each of the above mentioned trends had slowed or turned downward. The development of housing indicators, which also experienced a post depression improvement, has continued to expand.

Race has been the subject of considerable housing quality research. Beginning with the 1949 Housing Act, there has been a commitment to provide adequate housing to all citizens, regardless of race. Serious official efforts to meet these goals were actually initiated in the early 1960s (Amin & Mariam, 1987). Since then

there has been an improvement in the quality of housing for Blacks in the US (Bianchi, Farley, & Spain, 1982). Yet, an examination of 1975 data showed a substantially increasing distinction was present when Black housing quality was compared to that of Whites (Ladenson, 1978).

Variables Related to Inadequate Housing

Age of the unit has been shown to be predictive of housing quality (Baer, 1990; Phillips & Teitz, 1978). These findings suggest that unit age is negatively related to housing quality (Baer, 1990). Research indicates older units generally require more maintenance (Phillips & Teitz, 1978). The cost of additional maintenance and the relatively low potential return leads to poorer quality among older units.

Region has also been considered an important variable in the research concerning housing quality (Glaster, 1991; Lazere, Leonard & Kravitz, 1989). Research has indicated that the southern region of the US has had the highest rates of inadequacy relative to the other regions. As mentioned earlier, improper heating equipment was a major reason for those conditions. However, according to Lazere et al. (1989) housing in the South is more likely to have holes in the floors, cracks in the walls, waste disposal problems, bad water, evidence of rats, and incomplete plumbing.

Several studies have indicated that tenure is a reliable predictor of housing quality. Work in this area found that ownership

is positively related to higher housing quality (Crull, 1994; Spain, 1990). Owners were less likely to occupy inadequate housing (Apgar, 1989), and renters who lived in owner occupied structures typically resided in higher quality housing than other renters (Neels, 1982). Apgar (1989), for example, found that housing quality differences between homeowners and renters grew from 1974 to 1981. In an analysis of 1985 AHS data, Lazere et al. (1989) found that renters continued to be more likely to occupy inadequate housing than homeowners. In addition, rentership reduced the amount of housing maintenance and repair (Stegman, Brownstein, & Temkin, 1995). Considering this, it is imperative that the role of tenure in the perpetuation of inadequate housing is examined.

Several studies suggested that the presence (Apgar, 1989; Weisbrod & Vidal, 1981) and number (Crull, 1994) of children in the household was a dependable predictor of housing quality. These studies indicated that the presence of children was negatively correlated with housing quality. The negative relationship with housing quality was intensified for female headed households (Crull, 1994; Spain, 1990), and even stronger if the female had never been married (Spain, 1990b).

Like unit age, the age of the householder has also been related to housing quality (Lazere et al., 1989). Research suggests that households consisting of the married elderly (65 or older) are less likely to live in inadequate housing than households consisting of younger people (64 or younger) (Apgar, 1989). In the research by

Apgar (1989), single elderly households were more likely to live in inadequate housing than households consisting of younger people. Other research suggested that income rather than age determined the likelihood that elderly persons would reside in inadequate units (Lazere et al., 1989).

Income has been found to be highly correlated with housing quality. Within the literature concerning housing quality, income was considered a significant variable in over half of the studies. Most scholars studying housing quality see income as a reliable predictor (Weisbrod & Vidal, 1981; Agar, 1989; Joint Center for Housing Studies of Harvard University, 1993). In general, these studies found that income was positively related to housing quality (Weicher, 1989). Using 1974 AHS data, suggested that as income doubled, the number of units identified as inadequate, was proportionately reduced. Weicher (1989), using 1981 AHS data, argues that this relationship, although still significant, had weakened.

Recently, the relationship between housing cost burden and housing quality has been analyzed by scholars (Pynoos, Schafer, & Hartman, 1980; Joint Center for Housing Studies of Harvard University, 1993). The housing burden is calculated by figuring the portion of a household's income that is used to provide housing costs. Researchers have found that reducing the burden through housing assistance increased housing quality for those with low incomes (Weisbrod & Vidal, 1981; Neel, 1982; Yildiz, 1983; Lazere et al., 1989; Joint Center for Housing Studies of Harvard University, 1993). As

discussed above, these studies have found that a significant subset of the population pays over 30% of their income for housing cost. The Joint Center for Housing Studies of Harvard University (1993) found that 70% of the low income households paid over 50% of their incomes for housing costs. They further found that one third of the households without housing assistance lived in inadequate housing.

The relationship between housing assistance and inadequacy has also been included as a focus for housing quality research (Joint Center for Housing Studies of Harvard University, 1993). Much of this research is concerned with the amount budgeted and the distribution of that budget (Bratt, 1991; Nelson & Khadduri, 1992; Shlay & King, 1995). Focusing on the effectiveness of the various types of housing assistance, researchers found that housing assistance is positively related to higher housing quality when controlling for other conditions (Yildiz, 1983).

Of course the major independent variable, race, has been found to be linked to housing inadequacy (Joint Center for Housing Studies of Harvard University, 1993). Weicher (1989), however, has suggested that when controlling for other factors, race is rarely a significant predictor of housing quality. Weicher was not the first to arrive at this conclusion. Muth (1969) used multiple regression techniques to analyze data from the 1950 census. He found that although income was inversely related to unit inadequacy, race was unrelated. In subsequent studies, Muth (1974, 1980) supported his earlier findings.

Housing quality research has found no difference in the desire for high quality housing between Black households and White households (Darden, 1987). Research has indicated that Blacks living in lower quality housing was not a matter of choice. Therefore, several hypotheses have been developed to explain the contrast in housing quality between the two groups. One argument was that the massive migration of Blacks from the South created an imbalance in the housing market (Berry, 1976). This argument suggests that the increased housing demand heightened competition in the market, which allowed inadequate housing to fulfill an unmet need (Yinger, 1987). A second argument was that Blacks suffer poorer quality housing as a result of economic conditions (Weicher, 1989). Scholars in this vein suggest that Whites live in higher quality units because they can afford to, and do, pay more for housing. A third argument is that the discriminatory practices discussed above create the difference in housing quality (Yinger, 1987)

Others have found race to be a significant factor in the determination of housing quality (Lazere et al., 1989; Amin & Mariam, 1987; Kain & Quigley, 1975). Regardless of their explanation for why Black households are more likely to reside in inadequate housing units, all of the above scholars agreed that this was the case.

Central city construction costs have further reduced the housing supply available to Blacks in these segregated areas (Schill & Wachter, 1995). In communities where construction costs are high,

less new construction is initiated. Moreover, central city construction costs are higher than the surrounding suburban areas (Bellush & Hausknecht, 1980). It is not surpassing that Black households disproportionately live in central cities.

Suburban locations often offer Blacks integrated neighborhoods at the expense of homeownership. In 1991, suburban Black homeownership was 30% lower than that of Whites. Black homeownership rates in the suburbs were only two thirds of Blacks in central cities. Actually, Blacks have the lowest rate of homeownership of all racial or ethnic groups in the suburbs (Alba & Logan, 199?). Trends indicate that suburbia is experiencing the process of White flight. Although suburban white flight is relatively more deliberate, when compared to that of the central city, suburban segregation is increasing (Farley, 1991; Cloutier, 1984).

The above independent variables will be analyzed to determine the contribution that each makes in the perpetuation of inadequate housing. Considering the previous research, finding that White households had higher rates of perpetuated inadequate housing would be extremely surprising. However, it is questionable whether race will be a significant predictor of housing quality in a multivariate analysis. As discussed above, there is not consensus within the literature concerning the relationship between race and housing quality when controlling for other variables.

Summary of the Literature and Statement of Hypothesis

There were several important points in the literature reviewed. Although housing quality was the primary reason for early housing research, affordability, discrimination and segregation are more prominent in the literature. This change is generally because of the improvements in housing quality. The literature indicates that federal, state and local housing efforts have improved housing quality. Also the change can be contributed to the government support of and indifference to housing segregation and discrimination. Finally, the reduced importance of housing quality in the literature appears to result from the opinion that quality affects relatively few people.

Also, the literature indicated that inadequate housing is generally the result of economic decisions. The housing that is valued higher is less likely to be inadequate. Those with higher incomes are less likely to live in inadequate housing. Demographic variables related to income, such as education, also influence housing quality. Finally, housing industry officials (appraisers, government officials, landlords, mortgagors, newspaper managers, and realtors) profit from institutionalized segregation and discrimination.

The analysis to follow tests the hypothesis that units occupied by Black households are more likely to remain inadequate than similar units occupied by Whites. It is hypothesized that units occupied by Black households have more deficient conditions, are

more severely inadequate, and have less repair than units occupied by White householders. Race is expected to remain significant when controlling for selected factors. Crosstabulations are used to examine change of resident, number of children, education, gender, if the household receives housing assistance, income, metropolitan verses non-metropolitan location, structure type, tenure, and unit age as control variables. First, bivariate crosstabulations are used to determine if there is a relationship between each of the control variables and the dependent variable, perpetuation of inadequate housing (lack of repair in 1991). Second, the control variables that have a significant relationship with the dependent variable are introduced into three-way crosstabulations with race to determine if the relationship between race and perpetuation of inadequacy is spurious.

In subsequent regression analyses, the variables children, education, gender, change of resident, housing assistance, income, metropolitan verses non-metropolitan location, unit age, number of units in the structure, unit value or rent, and level of inadequacy in 1987 are analyzed to determine if race continues to maintain significance when controlling for these variables. The fundamental hypothesis for this research is that race is a significant variable in the perpetuation of inadequate housing regardless of additional independent variables in a multivariate analysis.

CHAPTER III

METHODS

This study examined the relationships among factors affecting the perpetuation of inadequate housing. In particular, it examined the repair or continued deficiency of units surveyed in the The American Housing Survey (AHS). The data for this research were taken from the AHS national core samples of 1987 and 1991. Although the AHS is conducted bi-annually, periodically surveyed units are replaced due to unit demolition, conversion and demographic changes in housing composition of the United States in that each unit in the weighted sample represents several units across the nation.

Originally, the survey was conducted annually and was identified as the Annual Housing Survey. It was necessary to change the name of the survey to the American Housing Survey in that it is currently conducted bi-annually. However, the acronym (AHS) was retained. The change from the annual survey to the bi-annual survey was made in 1975. Thus, both data points used in this study are taken from bi-annual surveys.

Surveyed units are visually inspected by an enumerator for each survey, but a resident may be interviewed by telephone, with the exception of units new to the survey. Surveyed units are selected through specific sampling methods from designated sample areas throughout the United States. The AHS sample consisted of a

group of primary sample unit areas (PSUs), which were composites of sub-units or Enumeration Districts (EDs) from the Decennial Census, which were further divided into segments. Primary Sampling Units areas were established by classifying all US counties singularly or in combination with other counties. Those counties with similar characteristics such as population density, rate of growth, and principal industry were combined; from these counties, the sample's PSUs were drawn to represent the various demographic groups. The EDs within each PSU were divided into small groups of addresses called segments. Segments were the smallest group of addresses that were interviewed.

The data set for this study was created by combining the 1987 and the 1991 unweighted (AHS) national core samples into one data set using the Statistical Program for the Social Sciences (SPSS). The combination of the data for the two years allowed a longitudinal analysis of units present in both years. Each unit in the longitudinal survey was assigned a permanent control number by the AHS, to be retained throughout inclusion in the survey. Thus, the data subsets were matched using the unit control numbers to create the longitudinal data set.

The study of the race of the people living in persistently inadequate dwellings was of foremost concern and therefore drove the methods of this research. First, only dwelling units designated as inadequate in the 1987 national core sample were included in the final data set. Units that were adequate in 1987 and became inade-

quate in 1991 were not included in the analysis of the perpetuation of inadequate housing. Some of the units were also inadequate both years. Other units were inadequate in only the 1987 sample and were repaired and considered adequate in 1991. Therefore, the data file contained units that meet one of the following two criteria: (1) inadequate in both periods, or (2) inadequate in 1987 and adequate in 1991. The units included in the analysis of the perpetuation of inadequate housing allowed for an examination of continued inadequacy in two time periods. The study spans a four-year time period to allow enough time for inadequacy to be considered persistent.

The Data Set Selection Process

Although approximately 50,000 housing units were examined in each of the two bi-annual unweighted samples, only 4,945 units were deemed moderately or severely inadequate in 1987 according to the AHS constructed variable ZADEQ. These 4,945 units were just over 9% of the 54,052 units in the 1987 sample.

To conduct this study, the research methods further dictated the use of only those units that had interviews of respondents who were residents of the sampled units. Several of the variables used in this research could only be supplied by a person living in the unit. Therefore, units were eliminated if the interview was completed by someone other than the householder (i.e., landlords, building maintenance people, or neighbors) when the resident did not respond after several attempts, if the unit was vacant, or if it was

no longer in the 1991 sample. Of the 4,945 units that were inadequate in 1987 (see Table 1), only 2,339 units had interviews that were completed by unit residents during both interview periods (although not necessarily the same households residing in the units in both survey periods).

Table 1

Selection of Study Sample Based on Resident Interviews

Resident Interviews	Units
Total Units Inadequate in 1987	4,945
Units Inadequate in 1987 with 1987 resident interview	3,026
Units Inadequate in 1987 with 1987 and 1991 resident interviews	2,339

Of interest is the status of the housing units that were lost from the 1987 sample due to a lack of 1991 resident interviews, a total of 687 units. Three hundred of the 687 units were classified with non-interview status due to absence or refusal of the resident (n=76), to a change in the residential status of the unit due to non-residential use, condemned, or conversion (n=115), or to removal of the unit (n=109). The other 387 units without resident interviews were vacant. Sixty-two percent of the vacant units were still inadequate in 1991. The inadequacy variable, ZADEQ, for the other 300 units was coded 9 (not applicable) in the 1991 survey.

Also of interest is the fact that of the 687 inadequate units in 1987 with no interview in 1991, 217 units (32%) had been occupied by Black residents and 448 units (65%) had been occupied by White residents in 1987.

For the reasons discussed earlier, this research examines only those units whose households were Black or White. Race is considered to be the key independent variable. Black is coded "1" and White is coded "0." All units that were not either Black or White households in both time periods were eliminated. When focusing only on the two racial groups, the data set was reduced to 2,228 units.

A small number of units had a change in race of household over the four years, but the total (n=85) was not large enough to study as a viable sub-sample. Therefore, those units were also removed from the sample. Only 2,143 units met the necessary criteria of inadequate units in 1987 with resident interviews in 1987 and 1991 and consistently occupied by the same race (Black or White) in each of the two time periods.

The 2,143 units that met all the criteria for inclusion in the final data set were then examined to verify the classification of inadequacy using the AHS variable ZADEQ. The examination used the individual components of the variable ZADEQ to replicate the composite variable. The examination indicated that there were 4 cases for which the classification could not be justified. Those 4 units were also removed from the final data set. Therefore, the final data set consisted of 2,139 unweighted cases (see Table 2).

Table 2

Selection Process of Final Data Set

Criteria	Total	Black	White
A Resident Interview Both Years	2,339	590	1,687
Only Black or White Household	2,228	579	1,649
No Racial Change of Household	2,143	548	1,595
Inadequacy Verified	2,139	547	1,592

Independent Variables

The research design allows for the race of the respondent who is considered the householder (the key independent variable) as well as other characteristics of the household and dwelling to be used as independent variables. Since the survey tracks the dwelling unit, some units had different households in the two time periods and it was not possible to determine what happened to an individual household. However, the role of race in the perpetuation of inadequate housing is assessed irrespective of the specific household occupying the dwelling because the dwelling was the unit of analysis. The issues under investigation are whether there were differences in the number of indicators characterizing inadequacy, the severity of inadequate conditions, and the repair of units in all cases related to the race (Black or White) of the householder. It is hypothesized that units occupied by Black households have more deficient conditions, are more severely inadequate, and have less repair than units

occupied by White householders. This hypothesis is based on the research reviewed that indicated that Black householders have fewer resources and less access to resources than White householders in similar situations.

In order to test the above hypothesis, additional independent variables were used as control variables. Some of the variables were characteristics of the dwelling and some were characteristics of the household. The condition of the unit in 1987 is also used as an independent variable in predicting the deficiency condition in 1991. All independent variables used in the study are defined in Table 3 and frequencies of the variables are given in Appendix A.

Table 3

List of Independent Variables

Name	Type of Variable	Description
Race	dichotomous (Black=1)	race of respondent
Location	dichotomous (Nonmetro=1)	location of dwelling
Decade built	categorical by decade	age of unit
Tenure	dichotomous (own=1)	homeowner or renter in 1987
Home value	continuous	value of owned unit (1987 respondent)
Contract rent	continuous	monthly rent paid by 1987 household
Number of units	continuous	number of units in structure in 1987

Table 3--continued

Name	Type of Variable	Description
New resident	dichotomous (Moved=1)	new household since 1987
Education level	continuous	formal education of 1987 respondent
Household income	continuous	total 1987 household income
Housing assisted	dichotomous (Assistance=1)	received housing assistance in 1987
Number of children	continuous	number of chldren in 1987 household
Female householder	dichotomous (Female=1)	gender of respondent in 1987
ZADEQ	categorical	dwelling adequacy level in 1987
Deficiency	continuous	deficiency level in 1987

Dependent Variables

To explain the operationalization of variables included in the measurement of housing inadequacy, the definitions of the items included in the measure are given below. These definitions were reconstructed by combining information taken from the Codebook for the American Housing Survey and the Enumerator's Interviewer Manual (US Department of Commerce, 1991).

Measures of Severe Inadequacy

There are five groups of indicators identified as measures of severe inadequacy and any one of the five could place a unit in the severely inadequate category according to AHS definitions. The indicator areas were plumbing, heating, electric, upkeep and hallways. Each of the five areas is discussed in detail below.

Plumbing was the first indicator, and the absence of any of the three fixtures in the bathroom plumbing group was enough to place a unit in the severely inadequate category. The respondent was asked the following question: Do you have complete plumbing facilities? They were asked to check one of the following three responses: (1) Yes, Exclusive Use, (2) Lack, One or Two Items, and (3) Lacked All Three Items. This item was give the variable name PLUMB and the description of Complete plumbing facilities.

A housing unit was severely inadequate if it lacked hot piped water or a flush toilet or was lacking both a bathtub and shower, for the exclusive use of the household. All plumbing items were defined for the exclusive use of the residents and could not have been used on a regular basis by someone living outside the household. However, facilities being used by long-term guests and friends frequently staying over or visiting would have qualified as an exception.

Also the tub and shower had to be installed equipment and therefore could not have been portables or sink hookups. Also a privacy or a chemical toilet was not considered a flush toilet. If

the flush toilet was not in the sampled unit, "Nc" was entered for this item. If all of the unit's bathrooms and half-bathrooms were for the household's use only, then "Yes" was selected. If any of the unit's bathrooms or half-bathrooms was used on a regular basis by someone not living in the household, then "No" was selected.

Heating was the second indicator, and any unit was considered severely inadequate in which the resident felt it was uncomfortably cold for more than twenty-four hours because the heating equipment broke down, and it broke down at least three times for more than six hours each time,. If the respondent felt the housing unit had been too cold for 24 consecutive hours, he or she was asked: How many times did (it or they all) break down for 6 hours or more? They were coded as follows: (0) No Breakdowns Lasting 6+ Hours, (1) 1 Breakdown, (2) 2 Breakdowns, (3-7) 3 to 7 or more Breakdowns, (8) Not Answered, (9) Not Applicable. This item was given the variable name NUMCOLD and the description of Number of heat breakdowns last winter lasting 6+ hours.

The heating item focused on winter comfort within the unit. Each respondent was asked "Last winter was there any time when the (house or apartment) was so cold for twenty-four hours or more that it caused anyone in your household discomfort?" The respondent's definition of "last winter" was accepted. "Yes" was entered if any of the occupants of the unit experienced discomfort because the unit was too cold for 24 consecutive hours or more. However, "No" was entered if the unit was not cold enough to cause discomfort, or if

the unit was not cold for 24 hours or more. If the occupants were absent from the sample unit for the entire winter, "Did not live here last winter" was entered. Also "Did not live here last winter" was entered if the occupants did not live in the sample unit "last winter."

To assure that the proper response was entered, several probing questions were asked concerning this item. The enumerators asked "Was that because the heating equipment broke down?" The heating equipment was considered broken-down if it was not providing heat at its normal heating capacity through some fault in the equipment. Excluded were situations in which a lack of fuel or utility breakdown caused the lack of heat. Only the occasions that the equipment was broken down for 6 hours or more were considered.

Electric (a group of electrical indicators) was the third group of indicators used to determine unit adequacy. A unit could be considered severely inadequate for one of two reasons. The first was the absence of electricity throughout the unit. This meant that no electricity could be used by the residents of the unit, because there was no wiring in the unit or there was no available source to supply electricity to the unit. The second reason electricity could have caused a unit to be considered severely inadequate required three indicators, exposed wiring, a room with no working outlets, and at least three blown fuses or tripped circuit breakers within the last ninety days.

The information for the first electrical indicator was gath-

ered in the section concerned with utilities and the associated cost. All respondents were asked the following question: Who pays for the electricity? They were asked to check one of the following: (1) Not Used; (2) Included in Rent, Condo Fee or Other Fee; (3) Obtained Free; or (9) Occupant Pays for Utility Separately. This item was given the variable name BUYE and the description of Occupant Pays for Electricity. Those units in which the respondent indicated that electricity was "Not Used" were considered Severely Inadequate.

A series of three questions were used to check for the second group of electrical indicators. The first question in the series asked: Is all the wiring in the finished areas of your home concealed either in walls or metal covering? It was coded as follows: (1) Yes, (2) No, (3) No Electrical Wiring, (8) Not Answered, (9) Not Applicable. This item was given the variable name NOWIRE and the description of Wiring in house concealed. There were several exceptions and explanations for this item. In some areas of the country, the building codes permitted electrical wiring that was not enclosed in the walls to be enclosed in materials other than metal, such as rubber or plastic. This question, however, asked about wiring that was concealed in walls or enclosed in metal coverings. "No" was entered if wiring was not concealed in the walls or was enclosed in any material other than metal regardless of local code. This question pertained only to living areas which were finished. Therefore, when a respondent asked if basement wiring should be considered, the respondent was asked if the basement was finished and was a living

area. If "no" was submitted to either, the respondent was asked to exclude basement wiring in response to this item. Extension cords or cable TV wires were not applicable for this item.

In units which had electric wiring but the occupants did not use electricity, "Yes-concealed" or "No" was entered as appropriate. "No electric wiring" was selected if there were no wires in the unit.

The second item in the series of electrical indicators was identified with the following question: Does every room have an electric outlet or wall plug that works? It was coded as follows: (1) Yes, (2) No, (8) Not answered, (9) Not Applicable. This item was given the variable name PLUGS and the description of Working electrical wall outlets in every room. A working electric wall outlet was one that was in operating condition, and could have been used when needed. However, the outlet did not have to be in use to be considered working. Other types of electrical outlets such as ones connected to extension cords and used as wall outlets were not considered working.

The final question in the electrical series involved an introductory explanation and question. It was explained to respondents that a blown fuse or tripped circuit breaker usually results in a temporary loss of electricity within the unit, until the fuse was replaced or the switch was reset. Each respondent was asked "Have any fuses blown or circuit breakers tripped in the last 3 months?" Only those who responded "Yes" were asked the following question, which was used to determine inadequacy: How many times in the last 3

months? Responses were coded as (1) 1, (2) 2, (3-7) 3 to 7 or more, (8) Not Answered, (9) Not Applicable. This item was given the variable name NUMBLOW and the description of Number of times blew fuses or breakers in last 90 days. "Yes" was selected if an electric fuse had blown or circuit breaker was tripped in the home at any time in the 3 months prior to the interview. Major pieces of installed equipment which had internal fuses (such as some air conditioners) were considered the same as house circuit fuses.

Upkeep was the fourth group of indicators and the presence of five of the six indicators was necessary to place the unit in the severely inadequate category resulting from poor maintenance. The upkeep group of indicators included cracks in a ceiling or walls, holes in the floor, an interior living section with more than a square foot of peeling paint or plaster, rats within the last ninety days, leaks from the outside, and leaks from the inside of the unit. Each of the six items are discussed in detail below.

The first upkeep item asked of all respondents was about cracks: Does the (house or apartment) have open cracks or holes in the inside walls or ceilings? Responses were coded as (1) Yes, (2) No, (8) Not Answered, (9) Not Applicable. This item was given the variable name CRACKS and the description of Open hole in the wall or ceiling. Not included were small holes (such as those caused by nails or other similar objects). Also not included were "hairline cracks" that appeared in the walls or ceilings, but were not large enough to insert the edge of a dime. The holes or cracks had to be

in the interior of the unit. The holes or cracks did not need to not go all the way through the wall into the next room or through to the exterior of the unit. The holes or cracks could have been caused by such things as rats or mice, broken plaster, rotten or broken wood or faulty masonry, or floors having separated from the walls, or some other reason.

The second upkeep item asked all respondents to evaluate their floors. Does the (house or apartment) have holes in the floors? Responses were coded as (1) Yes, (2) No, (8) Not Answered, (9) Not Applicable. This item was given the variable name HOLES and the description of Holes in floor. Not included as holes was a trap door leading to a storage area or throughways such as ventilation or heating ducts. The holes had to be in the interior of the unit. It was not necessary for the holes to go all the way through to a lower floor or through to the exterior of the unit. The holes could have been caused by such things as rats or mice, rotten or broken wood, faulty masonry, or some other reason.

For the third upkeep item, all respondents were asked the following question about their walls: Does the (house or apartment) have any area of peeling paint or broken plaster bigger than 12 inches by 12 inches? Responses were coded as (1) Yes, (2) No, (8) Not Answered, (9) Not Applicable. This item was given the variable name BIGP and the description of Broken plaster or peeling paint about 1 square foot. The area of peeling paint or broken plaster

had to be on the inside walls or ceilings. "Yes" was selected if there was at least one area of broken plaster that was larger than 8 inches by 11 inches. "No" was entered if there were several small areas of broken plaster, but none of the areas was larger than 8 by 11 inches.

All respondents were asked the following question as the fourth upkeep item: In the last 3 months have you seen any rats or signs of rats in the building? Responses were coded as (1) Yes, (2) No, (8) Not Answered, (9) Not Applicable. This item was given the variable name RATS and the description of Signs of rats or mice in building in last 90 days. The rats, or signs of rats, had to have been inside the house or building. Signs of rats included droppings, holes in the walls, or ripped or torn food containers. "No" was entered if no signs of rats had been seen during the 3 months prior to the interview or were seen by somebody other than the respondent. "No" was also entered if signs of rats were seen only outside.

The final two upkeep questions asked about water leaks. For the first item, all respondents were asked: Has water leaked into your home from outdoors in the last 12 months? Responses were coded as (1) Yes, (2) No, (8) Not Answered, (9) Not Applicable. This item was given the variable name LEAK and the description of Water leaked into the home from the outside in the last 12 months. For the second leak item, the respondent was asked: Have there been water leaks in the (house/apartment) from INSIDE the building in the last 12 months? Responses were coded as (1) Yes, (2) No, (8) Not Answered,

(9) Not Applicable. The second leak item was given the variable name ILEAK and the description of Leaks in the house from the inside in the last 12 months. This item did not include leaky faucets.

Hallway, the fifth group of indicators, which indicates conditions in public areas of multifamily units, required the presence of all four of the conditions to be considered severely inadequate. There must have been no working light fixtures, loose or missing steps, loose or missing railings, and no elevator or no working elevator (if the unit was more than three stories) to be regarded as a severely inadequate unit. This group of indicators was unlike the other indicators of housing conditions in that the enumerator responded to the items. For the first item, the enumerator determined the appropriate category for the following question: What is the condition of the light fixtures in the public halls? The responses were coded as follows: (1) No Public halls, (2) All Work, (3) Some Work, (4) None Work, (5) No Light Fixtures, (6) Unable to Determine, (8) Not Answered, (9) Not Applicable. This item was given the variable name LTSOK and the description Public Hall Light Fixtures Working. This item included areas outside of garden apartments and all halls traveled to reach the respondent's unit.

For the second Hallway item, the numerator determined the appropriate category for the following question: Are there loose, broken, or missing steps on any of the common stairways inside this building or attached to this building? Responses were coded as (1) Yes, (2) No, (8) Not Answered, (9) Not Applicable. This item was

given the variable name BADSTEP and the description Hazardous steps on common stairways. Common stairways were those which provided access to more than one unit.

For the third Hallway item, the numerator determined the appropriate category for the following question: Are all railings on the common stairways firmly attached? Responses were coded as (1) No Stairs Rails, (2) Yes, (3) No, (8) Not Answered, (9) Not Applicble. This item was given the variable name RAILOK and the desription Firmly attached stair railings. Firmly attached meant that the rail could be used with complete confidence. Common rails were those used to access more than one unit.

For the final Hallway item, the numerator determined the number of floors in the building with the following item: Stories from main building ectry to main apartment entry. Responses were coded as (0) None, on Same Floor; (1) One (Up or Down); (2) Two (Up or Down); (3-8) 3-8 Three to Eight or More; (98) Not Answered; (99) Not Applicable.

If there were more than three floors, the enumerator decided the appropriate category for the following question: Is there a passenger elevator on this floor? Responses were coded as (1) No Elevator, (2) At Least One Working Elevator, (3) All Elevators Not Working, (8) 1 to 3 Floors, (9) Not Applicable. The two items were given the variable names of CLIMB and ELEV. The former was given the description of Stories from main building entry to main apartment entry and the latter was given the description of Passenger

elevator in building.

In the AHS Codebook, procedures were given to replicate the calculation of the inadequacy variable, ZADEQ. Given in Table 4 below are the procedures for determining the classification of severely inadequate units (ZADEQ = 3). Only one of the five sets of indicators was needed for the dwelling to be designated severely inadequate.

Table 4

Calculation Procedures to Determine Severely Inadequate Dwelling Unit

Unit	Calculation
Plumbing	If PLUMB = 2 or If PLUMB = 3, ZADEQ = 3.
Heating	If NUMCOLD > 3 and NUMCOLD < 8, ZADEQ = 3.
Electric	If BUYE = 1, ZADEQ = 3, or If NOWIRE=2 and PLUGS=2 and NUMBLOW > 3 and NUMBLOW < 8, ZADEQ = 3.
Upkeep	If five of the six (LEAK or ILEAK or HOLES or CRACKS or PAINT or RATS) =1, ZADEQ = 3.
Hallways	If LTSOK= 4 and BADSTEP = 2 and RAILOK = 1 and (CLIMB >3 and CLIMB < 98 and ELEV = 2), ZADEQ = 3.

Measures of Moderate Inadequacy

There were also five groups of indicators that if one group was present could place a unit in the moderately inadequate category according to AHS definitions. The five indicator areas were (1) plumbing, (2) heating, (3) upkeep, (4) hallways, and (5) kitchens.

Descriptions of all five areas are provided in the following discussion.

Plumbing was one of those five groups and if there were no working toilets in the unit at least three times within the three months of the interview for at least six hours each time, then that unit was considered moderately inadequate according to AHS criteria. All respondents who had experienced a breakdown of all toilets were asked the following question: How many of these breakdowns lasted 6 hours or more? Responses were coded as: (0) None Lasted 6 Hours, (1-7) Toilet Breakdowns > 6 hrs, (8) Not Answered, (9) Not Applicable. This item was given the variable name NUMTLT and the description of Number of flush toilet breakdowns of 6 hours or more. This was concerned with the performance of toilets. Considered as "not working" were indicators such as a faulty flushing mechanism, broken pipes, stopped up soil pipe, no water supplied to the flush toilet, or other situations that caused an interruption in service. These breakdowns were included even if caused by natural disasters. "No" was selected if the household has more than one toilet and at least one of them was working at all times. If the respondent indicated that, for any reason, all flush toilets were not working at any time during the three months prior to the interview, then the respondent was asked the above question with the list of available responses.

The number of times the flush toilets were not working for six consecutive hours or longer during the three months prior to the interview was determined and entered. If the respondent reported

more than one occasion on which the flush toilets were not working, each was counted, but only if the breakdown for which the flush toilet(s) were not working was for 6 consecutive hours or more.

Heating was the second group of variables considered in the moderately inadequate section. Units were considered moderately inadequate if unvented gas, oil, or kerosene heating units were used as the main source of heat. For this item, the enumerator read a list of response categories until the heating equipment used most was selected by the respondent. The main type of heating equipment was entered even if it was temporarily out of order. If two types of heating equipment were used, the type used most was entered. If both were used equally, the type that appeared first on the list was entered. All respondents were asked the following question: What type of heating equipment is used most to heat the (house/apartment)? Responses were coded as: (1) Central warm-air furnace with ducts to individual rooms; (2) Steam or hot water system; (3) Electric heat pump; (4) Other, built-in electric units; (5) Floor, wall, or other built-in-hot-air heater without ducts; (6) Room heater using kerosene, gas, or oil, VENTED to the outside; (7) UNVENTED gas, oil or kerosene heater(s); (8) Portable electric heater(s); (9) Stove(s); (10) Fireplace(s) WITH inserts; (11) Fireplace(s) with NO inserts; (12) OTHER; (13) None. This item was given the variable name HEQUIP and the description of Main Type of Heating Equipment Used. Only those units with item number 7 (unvented gas, oil, or kerosene heaters) were considered moderately inadequate. This

condition alone was sufficient to label a unit moderately inadequate.

Upkeep was the third group of indicators in the moderately inadequate section. To be considered moderately inadequate the respondent had to have experienced the occurrence of three of the six conditions previously listed for severely inadequate units. Upkeep indicators were those resulting from poor unit maintenance. As discussed in the section concerning severely inadequate units, Upkeep indicators included leaks from the outside, leaks from the inside, holes in the floor, cracks in a ceiling or walls, more than a square foot of peeling paint or plaster, and rats during the ninety days prior to the interview.

Hallway (poor maintenance common areas), was the fourth group of indicators and indicated the conditions of public areas. To be considered moderately inadequate according to the AHS using the Hallway groups of variables, it was required that three of the four indicators were present. These conditions are the same as those discussed previously in the Hallway section of severely inadequate units. The indicators included no working light fixtures, loose or missing steps, loose or missing hand railings, and no elevator in buildings with more than three floors to be regarded as moderately inadequate.

Kitchen, the fifth group of conditions, considered the absence of a sink, range, or refrigerator for the exclusive use of the unit as sufficient to consider a unit moderately inadequate. The exami-

nation of the kitchen required the presence of a sink, a refrigerator, and a non-portable stove top. All three facilities had to have been present in the unit, although not necessarily in the same room, to be considered a complete kitchen. Finally, the kitchen facilities had to be for the exclusive use of the occupying household. The respondent was asked the following group of questions. Does the (house/apartment) have a kitchen sink? Responses were coded as (1) Yes, (2) No, (8) Not Answered, (9) Not Applicable. Does the (house/apartment) have a refrigerator? Responses were coded as (1) Yes, (2) No, (8) Not Answered, (9) Not Applicable. Does your (house/apartment) have cooking burners? Responses were coded as (1) Yes, (2) No, (8) Not Answered, (9) Not Applicable.

The responses to the group of questions were combined by the AHS to determine whether the unit had complete kitchen facilities: (1) Complete Kitchen Facilities Present, (2) No Complete Kitchen Facilities, and (3) Not Applicable. The created variable was given the name kitchen and described as Complete Kitchen. A bathroom sink could not have been considered a kitchen sink. The refrigerator must have been a working mechanical refrigerator. A freezer was not necessary. "No" was entered if the only refrigerator present did not work, and the family did not plan to fix or replace it immediately. Finally, it was not necessary that the cook stove or range was mechanical; it could have been a wood-burning stove. It must have been in working order. "No" was entered if the cookstove or range was not in working order and the household did not plan to fix

or replace it immediately. For those who indicated there would not be an immediate repair or replacement of the non functioning appliance, "No" was entered.

Procedures were given to replicate the calculation of the moderately inadequacy version of the variable, ZADEQ in the AHS Codebook (Hadden & Leger, 1990). Given in Table 5 below are the procedures for determining the classification of moderately inadequate (ZADEQ = 2). Only one of the five sets of indicators, was needed for the dwelling to be designated moderately inadequate.

Table 5

Calculation Procedures to Determine Moderately Inadequate Dwelling Unit

Unit	Calculation
	IF ZADEQ NE 3 then:
Plumbing	If NUMTLT > 2 and NUMTLT < 8, ZADEQ=2.
Heating	If HEQUIP=7, ZADEQ=2.
Upkeep	If any 3 =1 (LEAK or ILEAK or HOLES or CRACKS or PAINT or RATS), ZADEQ=2.
Hallways	If any 3 =1 (If LTSOK=4 or BADSTEP=2 or RAILOK=1 or (CLIMB >3 and CLIMB < 98 and ELEV = 2)), ZADEQ=2.
Kitchen	If KITCHEN=2 or KITCHEN=3, ZADEQ=2.

Replication Procedures

Replication of the procedures for the 1987 units verified that 385 units were severely inadequate and 1,754 units were moderately

inadequate in 1987 (Table 6).

Table 6

Distribution of Conditions Using the 1987 Housing Inadequacy Index ZADEQ

	Units Severely Inadequate/With Indicator		Units Moderately Inadequate/With Indicator	
	Total	Percentage	Total	Percentage
PLUMB	186	8.7		
NUMCOLD	106	5.0		
BUYE	18	0.8		
Melectric	12	0.6		
UPKEEP	91	4.3	718	36.4
Hallways	0	0.0	0	0.0
NUMTLT			97	4.5
HEQUIP			822	38.4
KITCHEN			236	11.0
1 category	357	16.7	1,642	76.8
2 categories	28	1.3	105	4.9
3 categories			7	0.3
Total n=2139	385	18.0	1,754	82.0

As Weicher (1989) indicated, the most frequent inadequacy indicator was heating with 38.4% of all inadequate units classified as moderately inadequate because of unvented heaters. However an additional third (33.6%) of all moderately inadequate units were moderately inadequate due to Upkeep indicators. The kitchen was incomplete for 11% of all inadequate units.

The 385 severely inadequate units were distributed across four of five sub-categories of severe inadequacy. Of all inadequate

units, the 8.7% of the units tagged for "Plumbing" were in the most common sub-category for severely inadequate units. Second most common for the severely inadequate sub-category was the 5% of all units included due to Heating problems.

Also Table 6 shows that 1.3% of all inadequate units were severely inadequate in two separate sub-categories. Far more prevalent were those units that were moderately inadequate in two sub-categories. For the moderately inadequate category, 4.9% of all units would have been inadequate in two sub-categories. Only 0.3% of all units were moderately inadequate in three separate sub-categories.

Expanded Deficiency Scale

To better understand the perpetuation of inadequate housing conditions, an expanded version of the three-level AHS inadequacy index that comprised ZADEQ was created. Previous research on poverty households indicated great variability in some items based on race and tenure that were suppressed in the three-level index (Crull, 1994). Due to the changes in the survey of housing, that were discussed earlier, the three-level AHS index discussed above is used by HUD for comparison with past data (Hadden & Leger, 1990). However, identical variables were used in the two surveys combined for this research, and thus were used to develop an expanded scale measuring unit quality. Improving the ability to measure quality with an expanded scale provided a more detailed examination of the number of

indicators that persisted over time. Also an expanded scale which produced a continuous dependent variable provided increased sensitivity for regression analysis.

Construction of the Deficiency Scale

In addition to examining the role of race in the perpetuation of inadequate housing this research investigates the items included in the index of indicators used by HUD to measure housing adequacy, specifically the variable ZADEQ in the American Housing Survey (Hadden & Leger, 1990). ZADEQ is a three-level measure that considers units adequate (1), moderately inadequate (2), or severely inadequate (3). The goal was to convert the AHS ordinal three level variable ZADEQ into an expanded measure of conditions of deficiency. To improve the understanding of housing quality, each of the inadequacy indicators were given a weighted numeric value. The indicators in the expanded scale were then summed to reflect the total incidence of deficiency. Where the ordinal scale saw units as, adequate, moderately inadequate, or severely inadequate, the expanded scale reflected a summed total value of each condition of deficiency.

The portion of the expanded scale that was based on the Upkeep sub-categories (cracks, leaks, peeling paint, holes, and rats) will be used as an example to illustrate the conversion process. Detailed coding procedures are given in Appendix B. Upkeep is selected as the example because it is included in both the severely inadequate and the moderately inadequate categories of the ZADEQ index. As

discussed earlier Upkeep included six conditions. For a unit to be severely inadequate, five of the six conditions must be present. If there were at least three of these conditions present, but less than five, the unit was identified as moderately inadequate.

To maintain consistency with the weight given to each measure in the ZADEQ procedure, Upkeep in the severely inadequate category was given a value of ten. It was then divided by the number of conditions necessary for the unit to be considered in the severe category (which was five), and produced a quotient of two. For the moderately inadequate version of Upkeep, three conditions were necessary. Therefore, the necessary product was six to consider a unit moderately inadequate in the Upkeep sub-category.

For consistency with the AHS and within this research the value of six was given to the conditions necessary for each sub-category of moderate inadequacy. The sub-categories of Numtlt (3 or more toilet breakdown of 6 or more hours), Heating and Kitchen (incomplete kitchen facilities) each required the presence of only one condition to be considered moderately inadequate. Thus, each of those measures was given the value six. However, Upkeep and Hallways each required three conditions to be considered moderately inadequate. Therefore, each measure in the sub-categories Upkeep and Hallways was given a value of two.

A value of ten was divided evenly among the components of each of sub-categories of severe inadequacy. Plumb (lack of complete plumbing facilities), Numcold (heat breakdowns lasting 6 + hours),

and Buye (electricity was not connected), each consisted of a single condition, which was given a value of ten. Electric (exposed wiring, damaged plugs, and regularly blown fuses) required the presence of all three conditions, so each was given the value 3.34. Upkeep required the presence of five conditions therefore each was given a value of two. Hallways required four conditions to be severely inadequate, thus each was given a value of 2.50. Because the same hallway indicators were used in both the severe and moderate categories, an adjustment was needed to address the difference in assigned weights. To adjust the hallways weight for severe (2.50) with the weight moderate (2.00), a weighted value of 2.25 was assigned for hallway indicators which were the same indicators for both severely and moderately inadequacy.

The expanded scale contained 19 components and the values in 1987 ranged from 6 to 33.35 with a median of 8.67 and a mean of 9.86 and the 1991 summed scale scores ranged from 0 to 36.01 with a median score of 4.00 and a mean value of 5.42.

The deficiency scale did not address all of the concerns stated in Chapter II with the measure of inadequacy, but it did improve the sensitivity and detail of the measure. The deficiency scale did not acknowledge the partial conditions in some sub-categories. For example if two fuses had blown instead of the required three, it would not be reflected in the expanded scale. More troublesome was not including other variables for which data were collected. Items such as water source breakdowns are not included in the deficiency

scale because they were not included in ZADEQ. These were not included by AHS officials because they would compromise the goal of consistency over time with the AHS scale ZADEQ.

CHAPTER IV

DATA ANALYSIS

This chapter is divided into four sections. First, a profile of housing inadequacy is discussed. The second section discusses the AHS housing inadequacy measures and repair in 1991 as dependent variables with regard to race. In addition, the third section of this chapter evaluates other selected independent variables (Location, Unit Age, Change of Resident, Tenure, Structure Type, Education, Income, Housing Assistance, Children, Gender). These independent variables are set up as controls in three-way tables of percentage of repaired units by race to evaluate perpetuation of inadequacy using a chi-square analysis. Finally, the regression analyses are presented to evaluate the perpetuation of inadequacy in a multivariate framework.

Profile of Housing Inadequacy

The AHS has traditionally used two categories of inadequacy: moderate and severe (Table 7). Of the 2,139 units in the 1987 data set 1,754 (82 %) were classified as moderately inadequate, while the other 385 (18 %) were in the severely inadequate category. The 385 units in the severe category had 413 conditions that were considered severe. The 1,754 units in the moderately inadequate category had a total of 1,873 conditions of moderate inadequacy.

Table 7

Distribution of 1987 Inadequate Dwelling Units by Race

Level of Inadequacy	# White	%	# Black	%	# Total	%
Severe	255	16.0	130	23.8	385	18.0
Moderate	1337	84.0	417	76.2	1754	82.0
Total	1592	100	547	100	2139	100

Chi-square = 16.56 Significance = .00005

When the distribution of 1987 inadequate dwellings were crosstabulated with the key independent variable, race of the respondent, there was a significant difference. About 24% of the Black households were in severely inadequate dwellings while only 16% of the White households occupied severely inadequate units. The hypothesis that Black households are more likely than White households to live in severely inadequate dwellings was supported.

In Table 8 the distribution of multiple indicators was evaluated in terms of race. In both the severely and moderately inadequate categories, black households were more likely to have 2 or 3 indicators of inadequacy than were white households. Therefore, the hypothesis that Black households have more deficient conditions than White households was supported. This was especially evident in the moderately inadequate category with a significant difference at the .05 level and almost significant in the severely inadequate category with a significant difference at the .06 level.

Table 8

Distribution of Number of Indicator Categories in 1987

Level of Inadequacy	# White	%	# Black	%	# Total	%
Severe						
1 indicator	241	94.5	116	89.2	357	92.7
2 indicators	14	5.5	14	10.8	28	7.3
Total	255	100	130	100	385	100
Moderate						
1 indicator	1276	95.4	366	87.8	1642	93.6
2 indicators	57	4.3	48	11.5	105	6.0
3 indicators	4	0.3	3	0.7	7	0.4

Severely inadequate -- Chi-square = 3.56 -- Significance = .05925
Moderately inadequate -- Chi-square = 31.29 -- Significance = .00000

In Table 9 there may appear to be an inconsistency within the numbers because some units had multiple conditions within an inadequacy category. However, no unit was inadequate in both the severe and the moderate category since the categories were considered mutually exclusive and conditions for the severe category were calculated before those of the moderate category.

Separate crosstabulations by race for each inadequacy indicator in Table 9 identified a significant difference for race in heating and upkeep in the severely inadequate category and heating and kitchen in the moderately inadequate category. In the severely inadequate heating indicator, a higher percentage of units occupied by White households than Black households were identified with heating breakdowns. However, in the moderately inadequate heating indicator, a higher percentage of Black households than White house-

holds were identified with unvented heaters. In the severely inadequate upkeep indicator, a much higher percentage of dwellings occupied by Black households than White households had problems with water leaks, holes, cracks, peeling paint, or rats. And finally, in the moderately inadequate kitchen indicator, a higher percentage of units occupied by White households than Black households had at least one of the three kitchen facilities (sink, refrigerator, or stove top) missing. Although there were significant racial differences for four of the nine inadequacy indicators, there appeared to be no overall racial pattern evident when individual inadequacy indicators were analyzed.

Table 9

Distribution of Indicators in 1987 Inadequate Units by Race*

Level of Inadequacy	# White	%	# Black	%	# Total	%
Severe						
Plumbing	125	49.0	61	46.9	186	48.3
Heating**	86	33.7	20	15.4	106	27.5
No Electric	12	4.7	6	4.6	18	4.7
Electrical	7	2.7	5	3.8	12	3.1
Upkeep**	39	15.3	52	40.0	91	23.6
Moderate						
Plumbing	81	6.1	16	3.8	97	5.5
Heating**	569	42.6	253	60.7	822	46.9
Upkeep	549	41.1	169	40.5	718	40.9

*Each indicator is a separate crosstab by race, percents are given for only the units with the inadequate indicator in each row.

**Significant Chi-square at .05 level

Analyses reported in Tables 7 and 9 were only conducted on the 1987 units that were classified as inadequate. Similar analyses would not be appropriate with this data set for inadequate units in 1991 because only the units inadequate in 1987 were included in the data set. Therefore, if similar analyses were to be performed for 1991, it would be necessary to add several units that had become inadequate in 1991 to the data set.

Repair of Inadequate Housing Deficiency Conditions

Based on information in the literature reviewed it was expected that the units in the severely inadequate category in 1987 were less likely than those in the moderately inadequate category to be repaired in the 1991 survey. The information indicated that units would only be repaired if that repair was deemed a reasonable investment. Severe repairs generally cost more than moderate repairs. Units were considered repaired if they had become adequate in 1991. To understand the repair issue without the complexity of inadequacy categories, the 1991 repair variable was calculated into two values; those that were repaired and adequate in 1991 and those that were still inadequate in 1991 regardless of the severity of inadequacy.

The analysis illustrated in Table 10 indicated that the units in the severely inadequate category in 1987 were less likely to be repaired in the 1991 survey. Only 44% of the severely inadequate units were repaired in the 1991 survey, compared to 63% of the moderately inadequate units. The analysis supported the information

found in the literature reviewed.

Table 10

Distribution of Inadequacy and Repair of Units in 1991 by 1987 Inadequacy Status

Same Units in 1991	1987 Inadequate Units: Moderately Inadequate		Severely Inadequate		Total	
Adequate (Repaired)	1109	63.2%	170	44.2%	1279	59.8%
Still Inadequate	645	36.8%	215	55.8%	860	40.2%
Total	1754	100%	385	100%	2139	100%

Chi-square = 47.76 Significance = .00000

When repair was analyzed in terms of race of the household (Table 11), 65% of the units occupied by White households were repaired and only 44% of the units occupied by Black households were repaired.

Table 11

Distribution of Inadequacy and Repair of Units in 1991 by Race

Same Units in 1991	1987 Inadequate Units: White		Black		Total	
Adequate (Repaired)	1039	65.3%	240	43.9%	1279	59.8
Still Inadequate	553	34.7%	307	56.1%	860	40.2%
Total	1592	100%	547	100%	2139	100%

Chi-square = 77.47 Significance = .00000

Therefore, the hypothesis that dwellings occupied by Black households were less likely to be repaired than dwellings occupied White households was supported by a significant Chi-square. The results that Black households rather than White households were more likely to live in severely inadequate housing (Table 7) and severely inadequate rather than moderately inadequate units were more likely to remain inadequate (Table 10) support this pattern.

Selected Independent Variables and Housing Repair

To meet the goals of this research study, it was essential that the research move one-step beyond that which has generally been the focus of those studying housing quality. Generally, research findings have indicated who lived in inadequate housing. This research focused on whose inadequate housing was repaired, and in contrast, whose housing was not repaired. Therefore, this research concentrated on identifying variables that correlated with moving units from inadequacy to adequacy to test the significance of the race variable in multivariate analyses. Three-way crosstabs were used to look at the effect of control variables on the relationship between race and repair to carefully observe the effects. This was necessary because this data set is demographically different from the full AHS data-set in terms of household demographics and housing conditions.

The results of the crosstabulation analyses helps in the understanding of specific effects of selected control variables on the

relationship of race and repair. Ten variables found in the literature that appeared to influence inadequate housing were analyzed as control variables in the crosstabulations. First, each potential control variable was crosstabbed with the dependent variable repair to test for a significant relationship with the dependent variable. Only variables with significant independent relationships with the dependent variable could be used as control variables in the three-way crosstabulations of repair by race. The significant control variables were then used in 3-way crosstabulations to test for spuriousness of the significant relationship between race and repair (Table 11 above).

Housing Repair by Race Controlling for Location

The reviewed literature suggested that units in metropolitan areas were more likely to be adequate than units in non-metropolitan areas. The results reported in Table 12 indicated that units in metropolitan areas were significantly more likely to be repaired than units in non-metropolitan areas. Therefore, location was used in a three-way crosstab to check for spuriousness of the significant relationship between race and repair.

In examining the role of race in the perpetuation of inadequate housing controlling for location, it was expected that those units occupied by White households were more likely to be repaired than those units occupied by Black households in metropolitan areas as well as non-metropolitan areas. This expectation was supported

by the data, indicating that the race of the household was a significant factor in the perpetuation of inadequate housing in both metropolitan and non-metropolitan areas (Table 13).

Table 12

Distribution of Inadequacy and Repair of Units in 1991 by Unit Location

Same Units in 1991	Location of 1987 Units: Metro		Non-Metro		Total	
Adequate (Repaired)	924	64.9%	355	49.7%	1279	59.8
Still Inadequate	500	35.1%	360	50.3%	860	40.2%
Total	1424	100%	715	100%	2139	100%

Chi-square = 45.97 Significance = .00000

Table 13

Distribution of Inadequacy and Repair of Units in 1991 by Race Controlling for Unit Location

Location	Race of Respondent in 1987 Units: White		Black		Total	
Metro						
Same Units in 1991 Adequate (Repaired)	736	68.8%	188	53.0%	924	64.9%
Still Inadequate	333	31.2%	167	47.0%	500	35.1%
Total	1069	100%	355	100%	1424	100%

Table 13--continued

Location	Race of Respondent in 1987 Units White		Black		Total	
Non-Metro						
Same Units in 1991 Adequate (Repaired)	303	57.9%	52	27.1%	355	49.7%
Still Inadequate	220	42.1%	140	72.9%	360	50.3%
Total	523	100%	192	100%	715	100%
Metro: Chi-square = 29.54			Significance		.00000	
Nonmetro: Chi-square = 53.47			Significance		.00000	

It is interesting to note that White households in metropolitan areas also had a higher percentage of the units repaired compared to the White households in non-metropolitan areas. Also, metropolitan units occupied by Black households were nearly twice as likely to be repaired as units occupied by non-metropolitan Black households. Therefore, although the race variable was found to not be spurious when controlled by location, the location variable continued to also have an effect of repair.

Housing Repair by Race Controlling for Unit Age

Literature indicated that older units were more likely to be inadequate. Data in Table 14 indicated a significant relationship between unit age and repair. Newer units (built in 1950 through 1987) were somewhat more likely to be repaired than older units and

the older units (built before 1950) were more likely to continue to be inadequate in 1991. Unit age was then used in a three-way cross-tab with repair and race.

Table 14

Distribution of Inadequacy and Repair of Units in 1991 by Age of 1987 Units

	Age of 1987 Units					
Same Units in 1991	Built before 1950		Built 1950-1987		Total	
Adequate (Repaired)	666	56.1%	613	64.4%	1279	59.8
Still Inadequate	521	43.9%	339	35.6%	860	40.2%
Total	1187	100%	952	100%	2139	100%

Chi-square = 15.08 Significance = .00000

Controlling for unit age was a test for spuriousness between race and repair (Table 15).

Table 15

Distribution of Inadequacy and Repair of Units in 1991 by Race Controlling for 1987 Unit Age

	Race of Respondent in 1987 Units					
Unit Age	White		Black		Total	
Built before 1950						
Same Units in 1991 Adequate (Repaired)	542	61.3%	124	40.9%	666	56.1%

Table 15--continued

Unit Age	Race of Respondent in 1987 Units White		Black		Total	
Still Inadequate	342	38.7%	179	59.1%	521	43.9%
Total	884	100%	303	100%	1187	100%
Built 1950-1987						
Same Units in 1991 Adequate (Repaired)	497	70.2%	116	47.5%	613	64.4%
Still Inadequate	211	29.8%	128	52.5%	339	35.6%
Total	708	100%	244	100%	952	100%

Before 1950: Chi-square = 38.09 Significance = .00000
1950-1987: Chi-square = 40.63 Significance = .00000

If the race repair relationship continued to be significant, it was expected that those units occupied by White households would be more likely to be repaired than those occupied by Black households in both newer and older units. The race difference was found to be significant in both unit age categories.

Housing Repair by Race Controlling for Change in Resident

Literature indicated that dwellings with a turnover in residents were more likely to be repaired than dwellings with no resident turnover. As shown in Table 16, the units with new residents since 1987 had a significantly higher percent repaired than the

units with the same 1987 residents. Because change in resident was significantly related to repair, the variable was then used as a control variable to test for spuriousness in the race variable.

Table 16

Distribution of Inadequacy and Repair of Units in 1991 by Change in 1987 Resident

	Change in 1987 Resident					
Same Units in 1991	Same Resident		New Resident		Total	
Adequate (Repaired)	804	56.1%	475	67.4%	1279	59.8
Still Inadequate	630	43.9%	230	32.6%	860	40.2%
Total	1434	100%	705	100%	2139	100%

Chi-square = 25.14 Significance = .00000

If race was not spurious with repair, it was expected that those units occupied by Black residents would have been less likely to have been repaired than those units occupied by White residents regardless of whether they had moved recently or were long term residents. The results of the 3-way crosstabs (Table 17) showed that there were still significant differences between White house-olds and Black households in both change of resident categories. Therefore, race was not found to be spurious when controlled by change in resident.

Table 17

Distribution of Inadequacy and Repair of Units in 1991
by Race Controlling for Change in 1987 Resident

Change in Resident	Race of Respondent in 1987 Units White		Black		Total	
Same Resident						
Same Units in 1991 Adequate (Repaired)	633	61.4%	171	42.4%	804	56.1%
Still Inadequate	398	38.6%	232	57.6%	630	43.9%
Total	1031	100%	403	100%	1434	100%
New Resident						
Same Units in 1991 Adequate (Repaired)	406	72.4%	69	47.9%	475	67.4%
Still Inadequate	155	27.6%	75	52.1%	230	32.6%
Total	561	100%	144	100%	705	100%

Metro: Chi-square = 42.31 Significance .00000
Nonmetro: Chi-square = 31.17 Significance .00000

Housing Repair by Race Controlling for Education

Literature reviewed indicated that education of the household head was a strong positive predictor of housing quality. The data presented in Table 18 showed that dwellings occupied by respondents with higher levels of education in 1987 than lower levels were more likely to be repaired in 1991. The significant positive relationship

between education and repair indicated that education could be used as a control variable.

Table 18

Distribution of Inadequacy and Repair of Units in 1991 by Education Level of Respondent in 1987 Units

Education Level of Respondent in 1987 Units						
Education Level	Adequate (Repaired)		Still Inadequate		Total	
0-11 Grade	448	47.6%	493	52.4%	941	100%
12 Grade	441	65.4%	233	34.6%	674	100%
13 Plus Grade	390	74.4%	134	25.6%	524	100%
Total	1279	59.8%	860	40.2%	2139	100%

Chi-square = 113.70 Significance = .00000

If race was not spurious, it was expected that race would remain a significant explanatory variable of housing repair regardless of education level. The data in Table 19 showed that for each of the three education categories, units occupied by White households were more likely to be repaired than units occupied by Black households. Race continued to be a significant variable for repair when controlled for education of the respondent.

The crosstabulated data controlling for respondent education also illustrated additional information of interest. The smallest difference in repair between the racial categories was in the lowest education category followed closely by the highest education cate-

gory. The largest difference in repair by race was found in the High School Graduate category.

Table 19

Distribution of Inadequacy and Repair of Units in 1991 by Race Controlling for Education Level in 1987 Resident

Education in 1987	Race of Respondent in 1987 Units					
	White		Black		Total	
0-11 Grade						
Same Units in 1991						
Adequate (Repaired)	330	52.5%	118	37.8%	448	47.6%
Still Inadequate	299	47.5%	194	62.2%	493	52.4%
Total	619	100%	312	100%	941	100%
12 Grade						
Same Units in 1991						
Adequate (Repaired)	360	71.1%	81	48.2%	441	65.4%
Still Inadequate	146	28.9%	87	51.8%	233	34.6%
Total	506	100%	168	100%	674	100%
13 Plus Grade						
Same Units in 1991						
Adequate (Repaired)	349	76.4%	41	61.2%	390	74.4%
Still Inadequate	108	23.6%	26	38.8%	134	25.6%
Total	457	100%	67	100%	524	100%

0-11 Grade: Chi-square = 17.93	Significance	.00002
12 Grade: Chi-square = 29.32	Significance	.00000
13 Plus Grade: Chi-square = 7.07	Significance	.00784

Therefore, the education level of the respondent seemed to continue to have a strong effect on repair even though race also continued to be significant.

Housing Repair by Race Controlling for Income

It was clear in the literature that income was positively related to housing quality. This is also the case in Table 20. In the lowest income category, only 45% of the units were repaired. There was a 13% increase in the percentage of units repaired in the middle income category over the lowest category. As expected, the highest income category had the highest percentage of the units repaired, with 73.9%.

Table 20

Distribution of Inadequacy and Repair of Units in 1991 by Income of Household in 1987 Units

	Income of Household in 1987 Units					
Income of Household	Adequate (Repaired)		Still Inadequate		Total	
Less than $8840	317	45.0%	387	55.0%	704	100%
$8840-$19999	361	58.0%	261	42.0%	622	100%
$200000 or more	601	73.9%	212	26.1%	860	100%
Total	1279	59.8%	860	40.2%	2139	100%

Chi-square = 132.16 Significance = .00000

The research expected that units occupied by Black households

would be significantly less likely to be repaired than those occupied by White households, regardless of income (Table 21).

Table 21

Distribution of Inadequacy and Repair of Units in 1991 by Race Controlling for Income of Household in 1987 Units

Income in 1987	Race of Respondent in 1987 Units White		Black		Total	
Less than $8840						
Same Units in 1991						
Adequate (Repaired)	217	50.2%	100	36.8%	317	45.0%
Still Inadequate	215	49.8%	172	63.2%	387	55.0%
Total	432	100%	272	100%	704	100%
$8840-19999						
Same Units in 1991						
Adequate (Repaired)	208	61.7%	81	48.2%	361	58.0%
Still Inadequate	174	38.3%	87	51.8%	261	42.0%
Total	454	100%	168	100%	622	100%
$20000 or More						
Same Units in 1991						
Adequate (Repaired)	542	76.8%	59	55.1%	601	73.9%
Still Inadequate	164	23.2%	48	44.9%	212	26.1%
Total	706	100%	107	100%	813	100%

Less than $8840:	Chi-square = 12.23	Significance = .00047
$8840 - 19,000:	Chi-square = 9.12	Significance = .00253
$20,000 or more:	Chi-square = 22.55	Significance = .00000

Once again, the results significantly support the expectation. Units occupied by Black households were less likely to be repaired than those occupied by White households in all income categories. Just a little over half of the units occupied by Black households (55%) were repaired in the highest income category which was close to the percentage of units occupied by White households (50%) in the lowest income category.

Housing Repair by Race Controlling for Number Children

The literature suggested that the number of children in a household was negatively related to housing quality. However, in this analysis, repair was similar for the lowest category (no children) and the highest category (3 or more children) (Table 22).

Table 22

Distribution of Inadequacy and Repair of Units in 1991 by Number of Children in 1987 Units

	Number of Children in 1987 Units					
Number of Children	Adequate (Repaired)		Still Inadequate		Total	
None	727	57.3%	542	42.7%	1269	100%
One or Two	403	65.7%	210	34.3%	613	100%
Three or More	149	58.0%	108	42.0%	257	100%
Total	1279	59.8%	860	40.2%	2139	100%

Chi-square = 12.69 Significance = .00176

The results presented in Table 22 showed that there was a difference in repair of dwellings between the no children and 3 or more children categories and the middle category of 1 or 2 children. The anomaly in the middle category of number of children was significantly different from both the highest and lowest categories.

When the role of race in the perpetuation of inadequate housing controlling for the number of children was examined, this research expected that units occupied by Black households would be less likely to have been repaired than units occupied by White households irrespective of the number of children. The differences between Black and White households were significant for each category with higher percentages of repaired dwellings for White households than Black households (Table 23).

Table 23

Distribution of Inadequacy and Repair of Units in 1991 by Race Controlling for Number of Children in 1987 Units

Number of Children in 1987	Race of Respondent in 1987 Units					
	White		Black		Total	
None						
Same Units in 1991						
Adequate (Repaired)	606	62.5%	121	40.5%	727	57.3%
Still Inadequate	364	37.5%	178	59.5%	542	42.7%
Total	970	100%	299	100%	1269	100%

Table 23--Continued

Number of Children in 1987	Race of Respondent in 1987 Units White		Black		Total	
1-2 Children						
Same Units in 1991						
Adequate (Repaired)	332	71.6%	71	47.7%	403	65.7%
Still Inadequate	132	28.4%	78	52.3%	210	34.3%
Total	464	100%	149	100%	613	100%
3 or More						
Same Units in 1991						
Adequate (Repaired)	101	63.9%	48	48.5%	149	58.0%
Still Inadequate	57	36.1%	51	51.5%	108	42.0%
Total	158	100%	99	100%	257	100%

None: Chi-square = 45.23 Significance = .00000
1-2 Children: Chi-square = 28.61 Significance = .00000
3 or More: Chi-square = 5.95 Significance = .01468

The largest difference was in the middle category (1 or 2 children), where less than half (48%) of the units occupied by Black households were repaired compared to well over two-thirds (72%) of the White occupied units were repaired.

Housing Repair by Race Controlling for Gender

In the review of the literature, all studies examining gender indicated that the variable, female headed households, was negative-

ly related to housing quality. In this study, 89% of the female respondents were female heads with no spouse present in the household. The significant results displayed in Table 24 also showed that those units occupied by female headed households were less likely to be repaired than those occupied by male headed households.

Table 24

Distribution of Inadequacy and Repair of Units in 1991 by Sex of 1987 Respondent

	Sex of Respondent in 1987 Units					
Same Units in 1991	Male		Female		Total	
Adequate (Repaired)	799	61.7%	480	56.8%	1279	59.8
Still Inadequate	495	38.3%	365	43.2%	860	40.2%
Total	1294	100%	845	100%	2139	100%

Chi-square = 5.19 Significance = .02268

In the examination of race controlling for gender (Table 25),

Table 25

Distribution of Inadequacy and Repair of Units in 1991 by Race Controlling for Sex of Respondent in 1987 Units

Sex of Respondent in 1987	Race of Respondent in 1987 Units					
	White		Black		Total	
Male						
Same Units in 1991						
Adequate (Repaired)	697	66.0%	102	42.9%	799	61.7%

Table 25--Continued

Sex of Respondent in 1987	Race of Respondent in 1987 Units White		Black		Total	
Still Inadequate	359	34.0%	136	57.1%	495	38.3%
Total	1056	100%	238	100%	1294	100%
Female						
Same Units in 1991						
Adequate (Repaired)	342	63.8%	138	44.7%	480	56.8%
Still Inadequate	194	36.2%	171	55.3%	365	43.2%
Total	536	100%	309	100%	845	100%

Male: Chi-square = 44.05 Significance = .00000
Female: Chi-square = 29.28 Significance = .00000

it was expected that those units occupied by White households would more likely be repaired than those occupied by Black households for both male and female headed households. The differences were significant. Units occupied by Black households were the less likely to be repaired than units occupied by White households irrespective of the sex of the household head.

Housing Repair by Race Controlling for Structure Type

The literature reviewed suggested that units in multifamily structures were more likely to be inadequate than were those in single-family structures. This research found that the control

variable structure type was not significantly related to repair of inadequate housing. Units in multifamily structures were not significantly less likely to be repaired than were units in single-family structures (Table 26). Therefore controlling for structure type in a crosstabulation was not appropriate because a control variable must be significantly related to the dependent variable to test for spuriousness of the independent variable.

Table 26

Distribution of Inadequacy and Repair of Units in 1991 by 1987 Structure Type

Same Units in 1991	1987 Structure Type: Single Unit		Two or More Units		Total	
Adequate (Repaired)	954	58.7%	325	63.1%	1279	59.8%
Still Inadequate	670	41.3%	190	36.9%	860	40.2%
Total	1624	100%	515	100%	2139	100%

Chi-square = 3.10 Significance = .07849

Housing Repair by Race Controlling for Tenure

In the literature reviewed, owners were found more likely to have higher quality dwellings than renters. This research found that there was no significant difference between units occupied by owners or renters in the repair of inadequate housing (Table 27). The lack of a relationship between tenure and the rate of repair of the units in the data eliminated the need to control for tenure in testing for

spuriousness. The failure of tenure to influence repair rates means that tenure would have no influence on the relationship between race and repair of inadequate housing.

Table 27

Distribution of Inadequacy and Repair of Units in 1991 by 1987 Tenure

Same Units in 1991	1987 Tenure Renter		Owner		Total	
Adequate (Repaired)	590	59.9%	689	59.7%	1279	59.8%
Still Inadequate	395	40.1%	465	40.3%	860	40.2%
Total	985	100%	1154	100%	2139	100%

Chi-square = 0.01 Significance = .92765

Housing Quality by Race Controlling for Housing Assistance

The literature indicated that there would be a positive relationship between housing assistance and unit quality. Units with assistance are inspected frequently to insure compliance with a minimum housing standard. Therefore, it was expected that units with housing assistance would more likely have been repaired than those without housing assistance. However this research found that there was no significant difference in repair of units with housing assistance and without housing assistance (Table 28). The lack of a relationship between housing assistance and repair of the units eliminated the need to run a crosstab controlling for housing

assistance.

Table 28

Distribution of Inadequacy and Repair of Units in 1991 by Housing Assistance for 1987 Units

Same Units in 1991	Housing Assistance for 1987 Units: None		Assisted		Total	
Adequate (Repaired)	1189	59.8%	90	59.2%	1279	59.8%
Still Inadequate	798	40.2%	62	40.8%	860	40.2%
Total	1987	100%	152	100%	2139	100%

Chi-square = 0.02 Significance = .87895

Regression Analysis

This section presents two sets of multiple regressions, one set of two regressions for owners and the second set of two regressions for renters. Although tenure was not significantly related to the repair of inadequate housing, separate regressions were used for owners and renters in order to include additional variables.

The literature concerning housing inadequacy and tenure was quite complex and basically supported three major findings. First, some of the research indicated that Black owners were more likely to live in inadequate housing and further that this was the result of institutionalized factors within the real estate industry. Thus Black renters had more freedom to relocate than Black homeowners. Second, however, the literature that focused on tenure in the gen-

eral population indicated that homeowners were less likely to live in inadequate housing than renters. Relative to the general population, the units in this research were all inadequate in 1987 and the units were disproportionately Black occupied. It was believed as discussed in the review of the literature, Black homeowners have greater difficulty securing home loans and that this may have contributed to the spuriousness of the relationship between tenure and repair. Third, the relationship of tenure was further complicated by the fact that tenure research on the general population contained a much higher average income than the data set used for this study. Therefore, both the Black and White homeowners in this research were less able to afford improvements. These factors probably suppressed the significance of tenure when related to repair.

In addition there are two variables that the literature indicated were strong predicators of housing quality that would have to be eliminated if owners and renters were in the same regressions. The use of the variables rent (the amount of contract rent paid) for renters and value (the estimated value of the unit) for owners would provide an improved explanation of the dependent variables. Therefore, separate regressions were calculated for owners and renters even though the tenure variable did not show a significant independent relationship with repair in the crosstabulation.

Each tenure regression set (two regressions for owners and two for renters) used the 1991 AHS traditional inadequacy index (ZADEQ) as the dependent variable for the first regression and the 1991 ex-

panded inadequacy scale (deficiency) created as a part of this research for the second regression. Block multiple regressions were used for the analysis which allowed the researcher to control input of the data into the regression. By controlling variable input the researcher was allowed to determine the content and the entrance of each block of the independent variables into the regression. Also using the block regression method presented a clearer picture of the effect of the independent of variables as groups on the relationship between the dependent variable unit inadequacy and the key independent variable race (Black coded as 1 and White as 0). The variable entered in the first block was race, followed by location in the second block (nonmetro coded as 1). The variables entered in third block were unit variables which included the value or rent, number of units in the structure, and decade in which the unit was built. Variables in the fourth block included household variables; new resident in 1991 (new coded as 1), education level of 1987 respondent, income of the household in 1987, housing assistance in 1987 (assisted coded as 1), number of children in 1987, and female respondent in 1987 (female coded as 1). The fifth and final block for each regression was the adequacy level in 1987 (either ZADEQ or deficiency appropriately matching the dependent variable).

Owner's Regressions

The first block entered in all of the regressions contained the key independent race variable which was coded 1 if the respon-

dent in 1987 and 1991 was Black and coded 0 if White. This dummy variable was found to have a significantly positive relationship in both owner regressions. The regression using ZADEQ as the dependent variable (Table 29) produced a significant standardized beta of .17 for Black and a .03 Ras a net effect.

Table 29

Regression Analysis of 1991 Inadequacy (ZADEQ) for 1987 Owners (Standardized Betas)

	Block 1	Block 2	Block 3	Block 4	Block 5
Race (Black)	.17*	.16*	.13*	.08*	.08*
Location (Nonmetro)		.18*	.14*	.11*	.09*
Decade Built			-.04	-.03	-.02
87 Home Value			-.18*	-.10*	-.11*
Units in Structure			-.03	-.02	-.03
New Resident				-.05*	-.06*
Grade of 87 Respondent				-.20*	-.16*
87 Household Income				-.07*	-.06
Housing Assisted in 87				-.05	-.03

Table 29--Continued

	Block 1	Block 2	Block 3	Block 4	Block 5
Number of Children in 87				.05	.03
Female Respondent in 87				.04	.04
87 Adequacy (ZADEQ)					.24*
R^2	.03	.06	.09	.14	.20
R^2 Adj.	.03	.06	.09	.14	.19
F Score	35.43	37.67	23.99	17.60	23.86
Significance	.0000	.0000	.0000	.0000	.0000
DF	1/1152	2/1151	5/1148	11/1142	12/1141

* Significant at the .05 level

By comparison the regression using Deficiency (the expanded scale) as the dependent variable (Table 30) was similar with the first block containing the race variable showing a significant beta of .19, and a R^2 of .03. These results indicate that if a unit was occupied by Blacks, it was more likely to be inadequate in 1991, which meant it was less likely to be repaired. However, the unexplained variance in both ownerregressions was compelling.

The dummy variable, Non-metro was entered in the second block. Non-metro was positively related to inadequacy and significant in both regressions in the second block. Non-metro produced a standardized beta of .18, and increased the R^2 to .06 in the first owner regression (Table 29).

Table 30

Regression Analysis of 1991 Inadequacy (Deficiency Scale) for 1987 Owners (Standardized Betas)

	Block 1	Block 2	Block 3	Block 4	Block 5
Race (Black)	.19*	.17*	.15*	.10*	.07*
Location (Nonmetro)		.19*	.15*	.13*	.09*
Decade Built			-.07	-.06*	-.03
87 Home Value			-.16*	-.08*	-.07*
Units in Structure			-.02	-.01	-.03
New Resident				-.03	-.04
Grade of 87 Respondent				-.18*	-.11*
87 Household Income				-.07*	-.05
Housing Assisted in 87				-.05	-.04
Number of Children in 87				.06*	.01
Female Respondent in 87				.05	.02
87 Adequacy (Deficiency)					.40*

Table 30--Continued

	Block 1	Block 2	Block 3	Block 4	Block 5
R^2	.03	.07	.10	.14	.29
R^2 Adj.	.03	.07	.09	.13	.28
F Score	41.32	42.74	24.97	17.01	38.04
Significance	.0000	.0000	.0000	.0000	.0000
DF	1/1152	2/1151	5/1148	11/1142	12/1141

* Significant at the .05 level

The second owner regression (Table 30) showed a beta of .19 for non-metro, and a R^2 of .07. These results indicated that units in non-metro areas were more likely than metro units to be inadequate in 1991. With the addition of non metro, the standardized betas for Black in both regressions were reduced slightly but remained significantly positive. Therefore the regression results of block 2 indicated that race continued to be a solid indicator of the perpetuation of housing inadequacy.

In the third block, three variables describing the dwelling unit were added to the regressions. The independent variables were the decade in which the unit was built, the owner's estimated value of the dwelling in 1987, and the number of units in the structure. All three variables were negatively related to both dependent variables, ZADEQ and deficiency (Tables 29 and 30). Number of units in the structure was not a significant indicator in either regression. Decade built was not a significant indicator in the regression on ZADEQ but was significant in the regression on deficiency. Newer

units were less likely than older units to be inadequate in 1991. Value was a significant, negative indicator in both regressions of inadequacy in 1991 which indicated that higher valued units were less likely to continue to be inadequate. Block three increased the adjusted R^2 to .09 and .10 respectively. The strength of the standardized betas for both Black and non-metro were reduced slightly with the addition of the third block of dwelling variables yet both remained significant in the regressions.

In block four of the regressions, six household variables were added to the regressions. Educational level of the 1987 respondent and household income in 1987 were both significantly and negatively related to inadequacy in 1991 in both regressions. Therefore, households with higher education and higher incomes were less likely to live in inadequate dwellings in 1991. Housing assistance and female headed households were not significantly related to inadequacy in either regression. New resident in 1991 was significantly and negatively related to ZADEQ in 1991 (the first regression, Table 29) which indicated that a unit with a new resident was less likely than the a unit with the same resident over the four year period to be inadequate. And finally, number of children in the 1987 household was significantly and positively related to deficiency in 1991 (Table 30) which indicated that units owned by households with many children were more likely to be inadequate in 1991 than units occupied by smaller households.

The addition of the six household variables in block 4 reduced

the betas of all the other variables already in the regressions. Although the beta for Black was reduced to .08 in Table 29 and to .10 in Table 30, Black continued to be a significant indicator of inadequacy. The variables added in Block five increased the R^2 to .14 for both regressions.

In the final block the 1987 measures of inadequacy were added to the regressions of owners. ZADEQ in 1987, which was an ordinal variable with moderately inadequate coded as 2 and severely inadequate coded as 3, and deficiency in 1987, an expanded scale ranging from three to 33 were used in the corresponding regressions with ZADEQ in 1991 or deficiency in 1991. Both of the 1987 inadequacy variables were positively related and significant indicators in their respective regressions (Tables 29 and 30). Both 1987 inadequacy variables were strong indicators, with the beta of .24 for ZADEQ and .40 for deficiency and both standardized betas were considerably higher than any other betas in the regressions. The results of the regression analyses for owners indicated that the strongest predictor of future inadequacy was past inadequacy. Furthermore, the strength of the 1987 inadequacy variables increased the R^2 for ZADEQ in 1991 (Table 29) to .20 and for deficiency in 1991 (Table 30) to .29. Based on the difference in variance explained, the impact of using the expanded deficiency scale to replace the three step ZADEQ index was considerable.

Although the major race variable in this research did decline in strength as each regression block was added, Black remained a

positive and a significant indicator through all five of the blocks in both owners' regressions in explaining inadequacy in 1991. Race, Black households in particular, was a significant predictor of the perpetuation of housing inadequacy in multivariate analyses.

Renters' Regressions

Similar multivariate analyses were preformed for renters. The key independent race variable, Black, was entered in the first block of the renters' regressions and was found to have a significant, positive relationship in both regressions. In the regression using ZADEQ as the dependent variable (Table 31), Black produced a standardized beta of .18 with a .03 R2. The regression using deficiency as the dependent variable (Table 32) produced a beta of .23, and a R^2 of .05. Units occupied by a Black households were more likely to be inadequate in 1991 than units occupied by White households.

Table 31

Regression Analysis of 1991 Inadequacy (ZADEQ) for 1987 Renters (Standardized Betas)

	Block 1	Block 2	Block 3	Block 4	Block 5
Race (Black)	.18*	.18*	.12*	.12*	.10*
Location (Nonmetro)		.08*	-.00	-.02	-.00
Decade Built			-.13*	-.12*	-.08*

Table 31--Continued

	Block 1	Block 2	Block 3	Block 4	Block 5
87 Monthly Rent			-.27*	-.21*	-.19*
Units in Structure			.10*	.09*	.06*
New Resident				-.07*	-.07*
Grade of 87 Respondent				-.09*	-.05
87 Household Income				-.06	-.07*
Housing Assisted in 87				-.01	.00
Number of Children in 87				-.05	-.04
Female Respondent in 87				-.10*	-.08*
87 Adequacy (Deficiency)					.27*
R^2	.03	.04	.12	.15	.22
R^2 Adj.	.03	.04	.12	.14	.21
F Score	32.88	19.45	27.90	15.80	23.04
Significance	.0000	.0000	.0000	.0000	.0000
DF	1/983	2/982	5/979	11/973	12/972

* Significant at the .05 level

Non-metro was entered as a dummy variable in the second block of the renters' regression. Non-metro was positively related and significant in both regressions. The standardized beta for non-metro

was .08 in the regression on ZADEQ and increased the R^2 to .04 (Table 31). In Table 32, the regression on deficiency, non-metro produced a beta of .09 and a R^2 to .06. The results indicate that for renters, units inadequate in 1987 in non-metro areas are more likely than units in metro areas to continue to be inadequate in 1991. The standardized betas for Black remained the same in both regression in block two. Also, in both regressions, Black had higher standardized betas than non-metro, which suggested that race was a more powerful indicator than location in predicting inadequacy in 1991.

Table 32

Regression Analysis of 1991 Inadequacy (Deficiency Scale) for 1987 Renters (Standardized Betas)

	Block 1	Block 2	Block 3	Block 4	Block 5
Race (Black)	.23*	.23*	.18*	.18*	.12*
Location (Nonmetro)		.09*	.02	.01	.02
Decade Built			-.18*	-.17*	-.11*
87 Monthly Rent			-.23*	-.18*	-.17*
Units in Structure			.06*	.06	.05
New Resident				-.09*	-.09*
Grade of 87 Respondent				-.04	.00

Table 32--Continued

	Block 1	Block 2	Block 3	Block 4	Block 5
87 Household Income				-.08*	-.06
Housing Assisted in 87				-.02	-.01
Number of Children in 87				-.01	-.02
Female Respondent in 87				-.08*	-.07*
87 Adequacy (Deficiency)					.37*
R^2	.05	.06	.15	.17	.29
R^2 Adj.	.05	.06	.14	.16	.28
F Score	53.46	31.14	33.41	17.55	32.86
Significance	.0000	.0000	.0000	.0000	.0000
DF	1/983	2/982	5/979	11/973	12/972

* Significant at the .05 level

In the third block of the renter regressions, three unit variables were added: decade built, 1987 monthly rent, and number of units in the structure. All three of the unit variables were significant in both regressions. The variables decade built and monthly rent were negatively related to inadequacy in 1991 in both renter regressions which indicated newer units and more expensive units were less likely than their counterparts to be inadequate in 1991. The third variable, number of units in the structure, was positively

related to inadequate in 1991 which indicated that larger multi-unit structures were more likely than smaller multi-unit or single unit structures to be inadequate in 1991. With the addition of the third block of unit variables, the R^2 increased to .12 for the regression on ZADEQ and to .15 on deficiency. The strength of the betas for the race variable Black in both regressions were reduced with the addition of third block into the regressions. Although the strength of the standardized betas for Black were reduced, the variable continued to be a significant predictor of inadequacy in both regressions for renters.

Six household variables were added to the regressions in the fourth block. Two of the six variables were significant in both regressions. New resident in 1991 and female headed household were negatively related to inadequacy in 1991 for renters. Housing assistance and number of children were not significantly related to inadequacy in 1991 in both renter regressions. The remaining two household variables showed mixed results with education level of the 1987 respondent significantly and negatively related to ZADEQ in 1991 and 1987 household income was significantly and negatively related to deficiency in 1991. The standardized betas for Black remained stable and significant with the addition of the household variables which indicated that Black occupancy contributed to units inadequacy in 1991. The addition of the fourth block increased the R^2 of each regression. The R^2 for ZADEQ in 1991 (Table 31) was increased to .15 and for deficiency in 1991 (Table 32) to .17.

As in the owners regressions, the final block of the Renters Regressions included the two step ordinal level variable ZADEQ in 1987 and the expanded scale deficiency in 1987. Both of the 1987 inadequacy variables positively and significantly related to inadequacy in 1991 with high standardized betas. The results of the renter regressions also indicated that the strongest predictor of future inadequacy was past inadequacy. Therefore, the more serious the problems in a rented unit, the less likely that unit was repaired. The power of explanation expressed in the variable ZADEQ in 1987 increased the R^2 for ZADEQ in 1991 (Table 31) to .22. The addition of deficiency in 1987 in the final block in the regression on deficiency in 1991 (Table 32) increased the R^2 to .29. The impact of using the expanded scale for inadequacy was beneficial in increasing the variance explained in the renter regression.

In summary of the regression analyses, the key race variable (Black) was the third strongest predictor of the inadequacy dependent variables for renters, fourth strongest for owners. Race remained significant and a relatively powerful indicator for both the owners and renters regressions using both inadequacy dependent variables. Although race was not the strongest indicator of future inadequacy, the regression results supported the hypothesis that race was a significant predictor of continued inadequacy irrespective of the other independent variables in multivariate analyses. Also, in both the owners and renters regressions, the expanded deficiency scale increased the amount of explained variance.

CHAPTER V

SUMMARY AND DISCUSSION

In this chapter the findings in previous chapters are summarized and discussed. Comparisons and contrasts between the body of literature and the findings of this research are presented. Recommendations are made for future studies on the subject of the perpetuation of housing inadequacy.

The idea that race plays a role in the perpetuation of inadequate housing was the foundation of this research. In the research literature reviewed, race and many other variables were related to housing quality. However, past research did not test the relationship of race and other variables with the perpetuation of inadequate housing. Therefore, testing the role of race in the perpetuation of inadequate housing was guided by only past research on housing quality.

In all tests conducted in this research, race was significantly supported as an indicator of the perpetuation of inadequate housing. More specifically, this research found support for the hypothesis that inadequate housing units occupied by Black households were more likely to continue to be inadequate than units occupied by White households. In the chi square analyses, there were significant differences by race in all categories of the significant control variables. Using block regression analysis, race re-

mained a significant variable in the explanation of inadequacy through the addition of all blocks of other independent (control) variables into the regressions. The results also showed that several other variables were strong predictors of the perpetuation of inadequacy.

Discussion of Inadequacy

Analysis of the various indicators used by HUD in defining inadequacy provided insight into housing conditions in 1987. The analysis of the 1987 data for inadequate dwellings indicated that electrical problems were rare. Also problems with plumbing and heating, except for the use of unvented heaters, were relatively rare in contrast to upkeep problems and the use of unvented heaters. Although there may be a cultural acceptance of unvented heaters as suggested in the literature, the acceptance of the use of unvented oil or kerosene heaters as the primary source of heat does not make this type of heating healthier or safer. Efforts should be made to educate people to not use unvented heaters.

In the analysis of dwelling inadequacy conditions, Black households were more likely than White households to live in severely inadequate housing in 1987 and that severely inadequate housing in 1987 was less likely than moderately inadequate housing to be repaired in 1991. Also, 6% to 7% of the inadequate units in 1987 had multiple indicators of inadequacy which indicated a depth of inadequacy. Units occupied by Black households were more likely to

have multiple indicators of inadequacy than units occupied by White households. These findings supported the pattern that inadequate housing units occupied by Black households were less likely to be repaired than units occupied by White households.

In order to account for the depth of inadequacy (multiple indicators) and for partial conditions in some inadequacy categories, an expanded scale of deficiency was developed based on the indicators used in the AHS inadequacy index ZADEQ. The expanded scale was very beneficial in the regression analysis. The regressions using the expanded deficiency measures increased the explained variance by 7 to 9 percentage points when compared to the three level index used by HUD. Therefore the research supported the benefits of using the new expanded scale. However, even with the improved inadequacy measure, less than one-third of the variance was explained in the regressions, and, therefore, additional research needs to be done.

Indicators of the Perpetuation of Inadequacy

Crosstabulation and regression analyses were used to test the significance of race as an indicator of the perpetuation of inadequate housing. Race, in particular Black households compared to White households, was found to be a significant indicator of the perpetuation of inadequate housing in every analysis. Therefore, in this research, there is overwhelming support for the hypothesis that inadequate housing occupied by Black households is less likely to be

repaired over time than inadequate housing occupied by White households.

In all regressions the strongest indicator of the perpetuation of inadequacy in 1991 was the past level of inadequacy in 1987. Therefore past level of inadequacy was the best indicator of future inadequacy. These findings support the literature which suggested that the decision to repair inadequate housing may be made based on a cost benefit analysis. However, the economic factors that contribute to units becoming inadequate and the perpetuation of inadequacy are not always a clear cost benefit situation. As discussed in the literature reviewed, actors and institutions in the housing market contribute to conditions which may not promote repair.

The education level of the respondent (householder) in 1987 was also a significant indicator of inadequacy in the owner regressions but was not significant in the renter regressions. Higher education appears to improve awareness of health and safety needs in the home.

The financial aspects of the dwelling (value of owner-occupied units and contract rent of renter-occupied units) were also strong indicators of repair of inadequate housing. This finding supports the literature and economic theory that units with higher values have a higher chance of returning value for the investment of repairs. Also, the significance of rent supports the role a cost benefit analysis plays in the perpetuation of inadequate housing. Those units for which the rent is high would cost more to remove

from the market and are therefore more likely to be made adequate.

Although insignificant in the owners' regressions, decade in which the unit was built was significant in both renters' regressions. The age of the unit is also part of the cost benefit analysis done by investors. Newer units have a higher chance of returning value for the investment of making repairs. However, owners do not have the same choices as renters. Renters may simply move to an adequate unit. Owners often have economic concerns and emotional ties which are not part of a renter's decision process. Most renters plan for the their unit to be a temporary place, while the opposite is generally true for owners.

New resident was significant in three of the four regressions. This supports the literature which suggested those who move are less likely to move into inadequate units. Thus landlords are likely to make repairs to attract new tenants and owners are likely to make repairs before putting their homes on the market.

Nonmetro which differentiated metropolitan areas for nonmetropolitan areas was significant in both owners' regressions but not significant in either renters' regression. The significant and positive relationship of nonmetro in the owners regressions supports the literature which suggested the units in rural areas were more likely to be inadequate.

Although a few other variables were significant but weak indicators in one or two of the regressions, female householder was the most perplexing variable. Female householder was significantly

negative in both renters' regressions and not significant and positive in both owners' regressions. These surprising findings suggested that rental units occupied by female householders were actually more likely to have their units repaired than were those occupied by male householders. These findings do not support the literature. However the data in this study were only on inadequate units and do not represent the same type of data in the literature reviewed. More research is needed to understand the role of female householders in the perpetuation of inadequate housing.

Race, Black households in comparison to White households, was significant in each regression after controlling for several variables suggested in the literature that would be influential on housing quality. Therefore, in this study, race was found to be a significant variable in the perpetuation of inadequate housing. Thus the key hypothesis, inadequate units occupied by Black households are more likely to remain inadequate than similar units occupied by White households, was supported throughout the findings of the study. The findings of this research support the need for continued efforts to address racial discrimination in housing, especially in the areas of housing inadequacy and repair.

Future Research

Expanding the inadequacy index to a additive scale was helpful in the regression analyses. However, just expanding the scale based on the same conditions that were included in the HUD index (ZADEQ)

may not be enough to really reflect the inadequacy of today's dwellings. Housing scholars and officials are aware of many hazards that their predecessors failed to consider or never imagined were potentially dangerous. Although the AHS quality index has been changed periodically to reflect advancements in knowledge and technology, the current AHS minimum quality standards potentially overlook millions of people who live in unsafe or unhealthy housing. AHS data, which are the most comprehensive housing data, do not consider lead, asbestos, pests other than rats, carbon monoxide, radon, or the availability of fire extinguishers and smoke alarms. Two popular reasons for not increasing the number of items included in the AHS survey are the comparability with past years and the cost of revision. Regardless of why additional hazards are not measured, it could be legitimately argued that housing conditions may actually be worse than suggested by the AHS data.

Although race was a significant variable in the multivariate analysis, the strength of the race variable was not overly strong. Some of the strength of the race variable may be influenced by the economic and education variables in the regressions. Institutionalized factors in society have created high correlates between these variables and race. Thus if the interaction effects of race and the economic and education variables are addressed, the actual influence of race may be better understood in the perpetuation of inadequate housing. For example, if the interaction of race and education was found to be relevant, improvements in the equity of education could,

theoretically, improve housing conditions of Blacks.

Additional study is needed to understand the process of repair for inadequate dwelling units. The strength of the level of inadequacy in 1987 was overwhelming in the analysis of the condition in 1991. It would seem feasible that the higher the cost of repairs, the less likely a unit would be repaired. Also the regressions indicated that higher values (for owners) or higher rents (for renters) lead to repairs. These two findings suggest that repair of housing units is influenced by potential returns of investments either by lending institutions or property owners. Admittedly, this is a large leap and more research specifically focusing on this issue should be attempted to further examine the relationship between cost of repairs and value of property with continued inadequacy. However, the relationships between these economic factors are complex. Factors in the housing market which may encourage profits from housing depreciation and degeneration may be more influential on repair decisions than cost of repairs and value of property.

Although race was a significant factor in the continuance of inadequate housing in the multivariate analyses with several other significant variables, just over one fourth of the variance was explained. It appears that additional variables must be identified and the investigation of interaction effects must be explored. Also, the regression analysis used the household characteristics of the 1987 residents and only included one variable, new resident in 1991, to account for change over the four year period. Additional

work could be done to study changes in household and dwelling characteristics over four years and if the changes add to the explanation of the perpetuation of inadequate housing.

And finally, the significance of race, only Black and White households, in the perpetuation of inadequate housing was identified in only one time period, 1987 to 1991. The study needs to be replicated on other time periods and possibly include additional minority groups.

Appendix A

Frequency Distributions and Statistics

BLACK race of respondent

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
White	.00	1592	74.4	74.4	74.4
Black	1.00	547	25.6	25.6	100.0
	Total	2139	100.0	100.0	

Mean = .256	Std err = .009	Median = .000
Mode = .000	Std dev = .436	Variance = .190
Kurtosis = -.745	S E Kurt = .106	Skewness = 1.121
S E Skew = .053	Range = 1.000	Minimum = .000
Maximum = 1.000	Sum = 547.000	

NONMETRO location of housing unit

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Metro	.00	1424	66.6	66.6	66.6
Nonmetro	1.00	715	33.4	33.4	100.0
	Total	2139	100.0	100.0	

Mean	.334	Std err	.010	Median	.000
Mode	.000	Std dev	.472	Variance	.223
Kurtosis	-1.507	S E Kurt	.106	Skewness	.703
S E Skew	.053	Range	1.000	Minimum	.000
Maximum	1.000	Sum	715.000		

RBUILT decade unit built

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
before 1920	1.00	373	17.4	17.4	17.4
1920-1929	2.00	205	9.6	9.6	27.0
1930-1939	3.00	294	13.7	13.7	40.8
1940-1949	4.00	315	14.7	14.7	55.5
1950-1959	5.00	287	13.4	13.4	68.9
1960-1969	6.00	276	12.9	12.9	81.8
1970-1979	7.00	314	14.7	14.7	96.5
1980-1987	8.00	75	3.5	3.5	100.0
	Total	2139	100.0	100.0	

Mean	4.121	Std err	.046	Median	4.000
Mode	1.000	Std dev	2.147	Variance	4.610
Kurtosis	-1.191	S E Kurt	.106	Skewness	.009
S E Skew	.053	Range	7.000	Minimum	1.000
Maximum	8.000	Sum	8814.000		

NUMUNIT number of units in structure

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	1.00	1624	75.9	75.9	75.9
	2.00	143	6.7	6.7	82.6
	3.00	38	1.8	1.8	84.4
	4.00	57	2.7	2.7	87.1
	5.00	15	.7	.7	87.8
	6.00	28	1.3	1.3	89.1
	7.00	13	.6	.6	89.7
	8.00	23	1.1	1.1	90.7
	9.00	10	.5	.5	91.2
	10.00	17	.8	.8	92.0
	11.00	2	.1	.1	92.1
	12.00	12	.6	.6	92.7
	13.00	3	.1	.1	92.8
	14.00	2	.1	.1	92.9
	15.00	7	.3	.3	93.2
	16.00	11	.5	.5	93.7
	17.00	4	.2	.2	93.9
	18.00	4	.2	.2	94.1
	19.00	1	.0	.0	94.2
	20.00	10	.5	.5	94.6
	22.00	2	.1	.1	94.7
	23.00	1	.0	.0	94.8
	24.00	5	.2	.2	95.0
	25.00	2	.1	.1	95.1
	26.00	3	.1	.1	95.2
	27.00	1	.0	.0	95.3
	28.00	2	.1	.1	95.4
	30.00	1	.0	.0	95.4
	32.00	2	.1	.1	95.5
	35.00	4	.2	.2	95.7
	36.00	8	.4	.4	96.1
	39.00	3	.1	.1	96.2
	40.00	6	.3	.3	96.5
	41.00	2	.1	.1	96.6
	43.00	1	.0	.0	96.6
	44.00	1	.0	.0	96.7
	45.00	2	.1	.1	96.8
	46.00	1	.0	.0	96.8
	47.00	1	.0	.0	96.9
	48.00	3	.1	.1	97.0
	50.00	3	.1	.1	97.1
	51.00	1	.0	.0	97.2
	52.00	2	.1	.1	97.3
	55.00	1	.0	.0	97.3
	58.00	57	2.7	2.7	100.0
	Total	2139	100.0	100.0	

Mean	4.367	Std err	.237	Median	1.000
Mode	1.000	Std dev	10.980	Variance	120.566
Kurtosis	15.347	S E Kurt	.106	Skewness	3.988
S E Skew	.053	Range	57.000	Minimum	1.000
Maximum	58.000	Sum	9342.000		

RGRADE1 highest school grade attended by respond

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	44	2.1	2.1	2.1
	1.00	11	.5	.5	2.6
	2.00	18	.8	.8	3.4
	3.00	37	1.7	1.7	5.1
	4.00	51	2.4	2.4	7.5
	5.00	53	2.5	2.5	10.0
	6.00	94	4.4	4.4	14.4
	7.00	92	4.3	4.3	18.7
	8.00	185	8.6	8.6	27.3
	9.00	104	4.9	4.9	32.2
	10.00	129	6.0	6.0	38.2
	11.00	123	5.8	5.8	44.0
	12.00	674	31.5	31.5	75.5
	13.00	88	4.1	4.1	79.6
	14.00	124	5.8	5.8	85.4
	15.00	41	1.9	1.9	87.3
	16.00	154	7.2	7.2	94.5
	17.00	26	1.2	1.2	95.7
	18.00	91	4.3	4.3	100.0
	Total	2139	100.0	100.0	

Mean	10.763	Std err	.084	Median	12.000
Mode	12.000	Std dev	3.906	Variance	15.253
Kurtosis	.242	S E Kurt	.106	Skewness	-.530
S E Skew	.053	Range	18.000	Minimum	.000
Maximum	18.000	Sum	23021.000		

HSGAST household received housing assistance

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
not assisted	.00	1987	92.9	92.9	92.9
assisted	1.00	152	7.1	7.1	100.0
	Total	2139	100.0	100.0	

Mean	.071	Std err	.006	Median	.000
Mode	.000	Std dev	.257	Variance	.066
Kurtosis	9.173	S E Kurt	.106	Skewness	3.341
S E Skew	.053	Range	1.000	Minimum	.000
Maximum	1.000	Sum	152.000		

NUMKIDS number of children in household

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
	.00	1269	59.3	59.3	59.3
	1.00	338	15.8	15.8	75.1
	2.00	275	12.9	12.9	88.0
	3.00	147	6.9	6.9	94.9
	4.00	65	3.0	3.0	97.9
	5.00	25	1.2	1.2	99.1
	6.00	11	.5	.5	99.6
	7.00	5	.2	.2	99.8
	8.00	2	.1	.1	99.9
	9.00	1	.0	.0	100.0
	10.00	1	.0	.0	100.0
	Total	2139	100.0	100.0	

Mean	.865	Std err	.029	Median	.000
Mode	.000	Std dev	1.329	Variance	1.766
Kurtosis	4.375	S E Kurt	.106	Skewness	1.886
S E Skew	.053	Range	10.000	Minimum	.000
Maximum	10.000	Sum	1850.000		

FEMALE sex of respondent

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
male	.00	1294	60.5	60.5	60.5
female	1.00	845	39.5	39.5	100.0
	Total	2139	100.0	100.0	

Mean	.395	Std err	.011	Median	.000
Mode	.000	Std dev	.489	Variance	.239
Kurtosis	-1.817	S E Kurt	.106	Skewness	.430
S E Skew	.053	Range	1.000	Minimum	.000
Maximum	1.000	Sum	845.000		

OWNER tenure status of household

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
renter	.00	985	46.0	46.0	46.0
owner	1.00	1154	54.0	54.0	100.0
	Total	2139	100.0	100.0	

Mean	.540	Std err	.011	Median	1.000
Mode	1.000	Std dev	.499	Variance	.249
Kurtosis	-1.977	S E Kurt	.106	Skewness	-.159
S E Skew	.053	Range	1.000	Minimum	.000
Maximum	1.000	Sum	1154.000		

ZADEQ adequacy of unit in 1987

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
mod inadequate	2	1754	82.0	82.0	82.0
sev inadequate	3	385	18.0	18.0	100.0
	Total	2139	100.0	100.0	

Mean	2.180	Std err	.008	Median	2.000
Mode	2.000	Std dev	.384	Variance	.148
Kurtosis	.780	S E Kurt	.106	Skewness	1.667
S E Skew	.053	Range	1.000	Minimum	2.000
Maximum	3.000	Sum	4663.000		

ZADEQ1 adequacy of unit in 1991

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
adequate	1	1279	59.8	59.8	59.8
mod inadequate	2	610	28.5	28.5	88.3
sev inadequate	3	250	11.7	11.7	100.0
	Total	2139	100.0	100.0	

Mean	1.519	Std err	.015	Median	1.000
Mode	1.000	Std dev	.695	Variance	.484
Kurtosis	-.340	S E Kurt	.106	Skewness	.976
S E Skew	.053	Range	2.000	Minimum	1.000
Maximum	3.000	Sum	3249.000		

RMOVED1 new resident moved in by 1991

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
same	.00	1434	67.0	67.0	67.0
new	1.00	705	33.0	33.0	100.0
	Total	2139	100.0	100.0	

Mean	.330	Std err	.010	Median	.000
Mode	.000	Std dev	.470	Variance	.221
Kurtosis	-1.475	S E Kurt	.106	Skewness	.726
S E Skew	.053	Range	1.000	Minimum	.000
Maximum	1.000	Sum	705.000		

VALUE property value of owned unit

Mean	52691.508	Median	38000.000	Mode	30000.000
Std dev	53260.086	Kurtosis	5.739	S E Kurt	.144
Skewness	2.263	S E Skew	.072	Minimum	.000
Maximum	275000.000				

Percentile	Value	Percentile	Value	Percentile	Value
10.00	8000.000	20.00	15000.000	30.00	25000.000
40.00	30000.000	50.00	38000.000	60.00	45000.000
70.00	55500.000	80.00	75000.000	90.00	113500.000

RENT monthly contract rent

Mean	246.644	Median	225.000	Mode	.000
Std dev	184.234	Kurtosis	.715	S E Kurt	.156
Skewness	.868	S E Skew	.078	Minimum	.000
Maximum	814.000				

Percentile	Value	Percentile	Value	Percentile	Value
10.00	.000	20.00	82.200	30.00	137.000
40.00	188.200	50.00	225.000	60.00	270.000
70.00	307.600	80.00	387.400	90.00	490.000

ZINC2 income of all household members

Mean	19626.230	Median	15000.000	Mode	20000.000
Std dev	19187.103	Kurtosis	14.044	S E Kurt	.106
Skewness	2.872	S E Skew	.053	Minimum	-10000.000
Maximum	200000.000				

Percentile	Value	Percentile	Value	Percentile	Value
10.00	3840.000	20.00	5460.000	30.00	8000.000
40.00	11296.000	50.00	15000.000	60.00	19000.000
70.00	23000.000	80.00	30000.000	90.00	40400.000

QUALITY sum of weighted deficiency indicators in 1987

Mean	9.861	Median	8.670	Mode	6.670
Std dev	4.705	Kurtosis	4.156	S E Kurt	.106
Skewness	1.949	S E Skew	.053	Minimum	6.000
Maximum	33.350				

Percentile	Value	Percentile	Value	Percentile	Value
10.00	6.000	20.00	6.670	30.00	6.670
40.00	6.670	50.00	8.670	60.00	9.340
70.00	10.670	80.00	12.010	90.00	16.670

QUALITY1 sum of weighted deficiency indicators in 1991

Mean	5.421	Median	4.000	Mode	.000
Std dev	6.080	Kurtosis	2.263	S E Kurt	.106
Skewness	1.445	S E Skew	.053	Minimum	.000
Maximum	36.010				

Percentile	Value	Percentile	Value	Percentile	Value
10.00	.000	20.00	.000	30.00	.000
40.00	2.000	50.00	4.000	60.00	6.250
70.00	6.660	80.00	10.000	90.00	14.000

Appendix B

SPSS Syntax for Expanded Deficiency Scale Based on ZADEQ

```
COMPUTE    RNUMCOLD=0.
IF (NUMCOLD = 3)  RNUMCOLD=10.
IF (NUMCOLD = 4)  RNUMCOLD=10.
IF (NUMCOLD = 5)  RNUMCOLD=10.
IF (NUMCOLD = 6)  RNUMCOLD=10.
IF (NUMCOLD = 7)  RNUMCOLD=10.

COMPUTE   RNOWIRE=0.
IF (NOWIRE = 2)  RNOWIRE=3.34.

COMPUTE   RPLUGS=0.
IF ( PLUGS = 2)   RPLUGS=3.34.

COMPUTE   RNUMBLOW=0.
IF ( NUMBLOW = 3)  RNUMBLOW=3.34.
IF ( NUMBLOW = 4)  RNUMBLOW=3.34.
IF ( NUMBLOW = 5)  RNUMBLOW=3.34.
IF ( NUMBLOW = 6)  RNUMBLOW=3.34.
IF ( NUMBLOW = 7)  RNUMBLOW=3.34.

COMPUTE   RNUMTLT=0.
IF (NUMTLT = 3) RNUMTLT=6.
IF (NUMTLT = 4) RNUMTLT=6.
IF (NUMTLT = 5) RNUMTLT=6.
IF (NUMTLT = 6) RNUMTLT=6.
IF (NUMTLT = 7) RNUMTLT=6.

COMPUTE    RHEQUIP=0.
IF (HEQUIP = 7) RHEQUIP=6.

COMPUTE   RKITCHEN=0.
IF (KITCHEN = 2) RKITCHEN=6.

COMPUTE    RPLUMB=0.
IF (PLUMB = 2) RPLUMB=10.
IF (PLUMB = 3) RPLUMB=10.

COMPUTE    RHOLES=0.
IF ( HOLES = 1) RHOLES=2.

COMPUTE   RCRACKS=0.
IF (CRACKS = 1)RCRACKS=2.

COMPUTE   RRATS=0.
IF (RATS = 1) RRATS=2.

COMPUTE    R2LEAK=0.
IF (LEAK = 1) R2LEAK=2.
```

```
COMPUTE    RILEAK=0.
IF (ILEAK = 1) RILEAK=2.

COMPUTE    RBIGP=0.
IF (BIGP = 1) RBIGP=2.

COMPUTE    RBUYE=0.
IF (BUYE = 1) RBUYE =10.

COMPUTE RLIGHTS=0.
IF (LTSOK=5) RLIGHTS=2.25.
COMPUTE RLIGHT2=0.
IF (LTSOK= 4) RLIGHT2=2.25.

COMPUTE RBADSTEP=0.
IF (BADSTE=2) RBADSTEP=2.25.

COMPUTE RRAILOK=0.
IF (RAILOK =1) RRAILOK =2.25.
IF (RAILOK =3) RRAILOK =2.25.

COMPUTE RCLIMB=0.
IF ((CLIMB > 3 AND CLIMB < 98) AND ELEV NE 2) RCLIMB=2.25.

COMPUTE   RLECTRIC=RNOWIRE+RPLUGS+ RNUMBLOW.

COMPUTE RUPKEEP=RHOLES+RCRACKS+RRATS+R2LEAK+RILEAK+RBIGP.

COMPUTE RHALLWAY=RLIGHTS + RBADSTEP + RRAILOK+ RCLIMB + RLIGHT2.

COMPUTE QUALITY=RHALLWAY+RNUMCOLD+RPLUMB+RBUYE+RLECTRIC+
                RUPKEEP+RNUMTLT+ RKITCHEN+RHEQUIP.
```

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