

THE RELATIONSHIP OF HOUSING COSTS AND QUALITY TO HOUSING SATISFACTION OF OLDER AMERICAN HOMEOWNERS: REGIONAL AND RACIAL DIFFERENCES

Lillian Y. Zhu and Gladys G. Shelton, Ph.D.

Abstract

The American population is aging and exhibits an increased desire and trend for aging-in-place. The high proportion of homeownership among older Americans influences this desire to remain in their own environment in the later years of life. Rapid increases in housing costs associated with securing and maintaining housing units have not deterred older Americans from desiring to sustain independent living. Recent studies of this older segment of the population have suggested the need to further investigate the association between housing costs, housing quality and residential satisfaction. Using 1991 American Housing Survey data of homeowners aged 65 and over, this study tested the effects of housing costs and quality on residential satisfaction, and examined these effects by regional and racial differences of the elderly homeowners. A logistic regression model was developed to estimate factors likely to affect the homeowners' satisfaction. The results showed that the majority of elderly homeowners were very satisfied with their housing, and while some dwelling deficiencies were reported, the influence of housing quality on residential satisfaction was found positively related among the four regional and two racial classifications. Housing satisfaction in relationship to housing costs was significantly different by race; only White householders who paid more for housing reported greater residential satisfaction.

As the American society ages, the housing market will focus more on the needs and desires of the older population, whose concerns will receive greater emphasis. In order for the market to meet the diversity of housing needs across regional and racial differences, it is vital for public policy makers, advisors, and advocates to understand the effects of indicators of housing satisfaction specific to this population. Based on this study, housing quality was one of the most influential factors contributing to older adult's housing satisfaction. Policies and programs addressing housing quality will influence older Americans' preferences for remaining in their own homes, and their quality of life, as well.

Lillian Zhu is a doctoral student and Gladys Shelton is an Associate Professor in the Department of Housing and Consumer Economics at the University of Georgia.

Introduction

Older Americans have comprised a rapidly growing segment of the population during recent decades. Persons 65 years and older comprised 11.4% of the population in 1980, 13% in 1993; they are projected to be more than 20% by 2050 (U.S. Bureau of the Census, 1994). Today, one in eight consumer units has a household head 65 years or older (Taeuber, 1992). Such a large demographic shift, as well as changes in residential living in response to retirement, widowhood, declining finances, and chronic health problems, causes housing for older persons to be of great concern (Golant, 1992).

A high proportion of older persons are homeowners whose residential preference is to age-in-place. About four fifths of older Americans between 65 and 74 owned their home in 1990 (U.S. Bureau of the Census, 1993). According to the third national telephone housing survey sponsored by American Association of Retired Persons (AARP) in 1992, aging-in-place is one of the important trends in elderly housing in the 1990s. Eighty-five percent of older people want to stay in their homes and never move (AARP, 1994).

The increasing number of older homeowners has a considerable effect on the housing market and on housing-related services, and current residential issues and perceptions can help identify and project the directions of housing market development. Many older homeowners are faced with the dilemma of deciding what proportion of their limited income to spend on housing. Their choice of either living in adequate housing and foregoing other needed goods and services, or of accepting lower cost, less adequate housing (fewer dollars for maintenance), are both realistic. Often, the decision is made to sacrifice housing quality, a decision that lowers their degree of residential satisfaction. To serve the housing needs of the older homeowners and to be well prepared for societal aging, it is imperative that housing research focus on whether older Americans are satisfied with their residences based on housing quality and cost, and whether the residential satisfaction of elderly homeowners differs by race and region.

Literature Review

Elderly Homeowners

Housing for older persons has been one of the most prevalent topics in housing research since the 1970s. Increasing proportions of Americans have been acquiring and retaining residential property before their older years (Kendig, 1990). Chevan (1987) shows that homeownership at ages 65 to 75 years rose from 48% in 1940, after the Depression, to 70% by 1980. A recent study by Golant and La Greca (1995) shows that elderly households have a higher homeownership rate than most other age groups, although their propensity to own declines markedly after age 74. They also found that homeowners have a lower housing deficiency rate than renters, and that the poverty rate of elderly owners is higher than that of comparable groups of non-elderly households (Golant & La Greca, 1995).

Residential Satisfaction

Overall well-being is based in part on life satisfaction, of which housing satisfaction is a major component (Campbell, Converse, Rogers, 1976; Lawton, 1986). Fried and Gleicher (1961) were among the first to suggest that residents' satisfaction might be a more appropriate criterion for evaluating the quality of housing, than are observed physical characteristics such as structure and plumbing. Morris and Winter (1978) examined the impact of housing deficits and household characteristics on housing satisfaction and found that satisfaction is reduced when deficits exist that deviate from cultural norms for space, tenure and structure type. Among the many factors that affect housing satisfaction, homeownership itself leads to an increase in residential and neighborhood satisfaction (White & Schollaert, 1993) and housing quality is the most influential factor on housing satisfaction (Ha & Weber, 1991). Previous research has also found a high level of residential satisfaction among elderly households (Kendig, 1981; Lawton, 1985; Rabushka & Jacobs, 1980). The reported satisfaction is greater as chronological age increases (Campbell et al., 1976), although the higher satisfaction levels of older persons must be treated cautiously given the low expectations of many older people (Lawton, 1985).

Housing Costs

The burden of housing costs for older tenants has increased since the post-war years. Since the mid-70s, housing costs have increased rapidly, and in many cases incomes have failed to keep pace with these rising costs (Salins, 1987). In general, elderly households spend a very large proportion of their income on housing (Vliet, 1992). Although homeownership moderates the poverty level of actual dollar income, many older homeowners still live near poverty levels (Olson, 1982; Struyk, 1987). The AARP (1994) survey further supported these facts: people with incomes under \$12,000 were relatively more likely to feel that their utility bills were too high, while three fourths of older persons reported property tax increases from 1989 to 1992. Households with excessive housing expenditure burdens are more likely to occupy poor quality housing, since the financial strain often results in poor maintenance and dwelling upkeep (Golant, 1982).

Housing Quality

Many research studies have focused on the housing deficits of older persons. Lawton (1985) concluded that the impact of housing deficiency falls heavily on vulnerable older people. On the other hand, Struyk (1987) reported that many older people have only minor housing deficiencies or problems in the use of dwellings in reasonably good condition. His study showed that there was not a significant difference in dwelling deficiencies between elderly homeowners and non-elderly homeowners. However, older persons were significantly more likely to have kitchen and plumbing deficiencies and inadequate heating and cooling equipment than are non-elderly homeowners. Poor elderly households were significantly less likely to incur excessive

housing costs than were poor non-elderly households, irrespective of their owner-renter status or racial identity (Golant & La Greca, 1995).

The definition of housing quality varies. According to a 1981 definition of a physically inadequate dwelling issued by the U.S. Department of Housing and Urban Development (HUD), housing quality is measured through ten possible deficiencies in the areas of plumbing, kitchen facilities, physical structure, common area fixtures, heating, and electrical systems (Appendix A). Researchers have attempted to measure inadequate housing through the American Housing Survey (AHS) (Hadden & Leger, 1990). Struyk (1977b), in an analysis of 25 deficiencies based on Goedert and Goodman's *Housing Quality Key Indicators* (1977), found that elderly headed households on the average were only "modestly less well housed" than the population at large. Struyk and Turner (1984), using eight of HUD's ten deficiencies to judge a physically inadequate housing unit, found that tenure, age, and composition of dwelling deficiencies were related to housing inadequacy. Weicher (1986) recommended the inclusion of three additional criteria in the measurement of housing inadequacy: i.e., frequent heating system breakdowns, holes in interior floors, and loose or missing steps in public hallways.

Using the AHS data set, different measurements on housing quality were carefully designed and evaluated by researchers. A frequently used hierarchical three-level measure, computed by HUD, identified dwelling units as "adequate", or as having "moderate" or "severe" physical problems in specifically designated categories (Hadden & Leger, 1990). But the HUD measure defines two unequal levels, moderate and severe, with no apparent theoretical or methodological basis for the distinction (U.S. Bureau of the Census, 1989). Golant and La Greca (1995) computed an overall numerical measure that represented a simple count of the number of physical deficiencies (as many as 26) afflicting each dwelling unit. This measure makes no judgment about which problems are more serious, but concludes that dwellings with multiple deficiencies are a greater threat to their occupants' well-being. Golant and La Greca (1995) designed another measure, named *numerical*, to alleviate the weakness inherent in global indicators of housing deficiencies. *Numerical* was calculated by grouping the 26 deficiency indicators into six conceptually and policy-related sets, namely, dwellings lacking kitchens, lacking plumbing facilities, disrepair (outside or inside), inadequate heating or cooling equipment, plumbing or sewer breakdowns, and common-area deficiencies.

Racial and Regional Differences

Numerous studies have focused on indicators of housing quality disparity between White and Black residents (Shelton & Sillah, 1996). Factors that have been identified that contribute to these persistent disparities in housing quality include location, income levels, household composition, tenure type, race, and past and present discrimination. The studies consistently support the role of discrimination as it contributes to the disparity in housing conditions, although discrimination is a variable difficult to document.

Age and race of the householder have been significant determinants of homeownership in most studies examining these effects (Buist, Megbolugbe, & Trent, 1994). Buist et al. also reported that homeownership rates by races were relatively stable, based on statistics derived from the American Housing Surveys in 1973, 1978, 1980, 1985, and 1989, and that the differences in homeownership rates among races seem to persist through time and across data sets. Shelton and Sillah (1996) cited several studies reflecting the racial disparity in mortgage lending, particularly towards blacks. Discrimination in mortgage lending has resulted in lower homeownership rates for Blacks than for Whites. The proportion of Whites who own their homes is 158% of the number of African-American or Hispanic homeowners (Wachter & Megbolugbe, 1992). Black elderly households are more likely than Black non-elderly households to own homes, but elderly Black households have substantially lower rates of homeownership, than elderly households in general. Poor elderly Black homeowners are still significantly more likely than poor non-elderly Black homeowners to occupy physically deficient dwellings (Golant & La Greca, 1995; Struyk & Turner, 1984). As concluded by Memken and Canabal (1991) from their study findings, minority status was significantly negatively related with residential quality deficiency. The housing affordability issue is connected most likely to low-income households, which include a large proportion of non-White people (Buist et al., 1994; Salins, 1987).

The aging and the age-in-place trends of society are becoming an overwhelming reality. Elderly homeowners' residential satisfaction not only affects matters of health and safety for the aged but also reflects the housing and services market needed for this older consumer group. Increased housing costs and problematic housing quality revealed by previous researchers support the framework of this research; previous research implications have suggested a need to investigate residential satisfaction related to the housing cost and quality experienced by older Americans. In this study, the effect of housing cost and quality on elderly homeowners' housing satisfaction is explored through regional and racial differences.

The purposes of the study are (1) to examine the housing cost and housing quality of homeowners who were 65 and over in 1991; (2) to investigate the effects of elderly homeowners' housing cost and quality on their residential satisfaction in 1991; and (3) to test if such effects are different by region and race. The research hypothesized that residential satisfaction of elderly homeowners in 1991 was influenced by housing cost and quality, and that there were racial and regional differences in cost/quality-based housing satisfaction.

Methods

Data Source and Sample

The 1991 American Housing Survey (AHS) is the data source for this study. The 1991 AHS is a national survey conducted by HUD on current housing characteristics. The data were collected by Census Bureau interviewers who contacted households occupying each housing unit in the AHS sample (Hadden & Leger, 1990).

This study uses only households with a householder aged 65 and over who owned the dwelling unit in 1991. Approximately 20% of the initial sample was eliminated because necessary housing satisfaction information was missing. After a series of examinations, an additional five percent of the older homeowners who had less than \$50 or greater than \$1,500 in monthly housing costs, or had less than \$1,000 or more than \$140,000 in annual income, were dropped from the study sample to eliminate extremes that might bias the sample means. According to the Census statistics (Taeuber, 1992), the average monthly housing cost was \$515 for elderly homeowners with mortgage payments and was \$210 for those who had paid their mortgages in full by 1989. The poverty levels were \$7,086 for the 65 and older single-person households and \$8,241 for two-person households in 1991 (U.S. Bureau of the Census, 1991). The final study sample included 7,444 elderly homeowners. The assumptions are that the household is the unit of measurement and that there is only one householder in each household (Golant & La Greca, 1995; Khadduri & Nelson, 1992; Taeuber, 1992).

Measurement

To accommodate the model and analyses, the housing satisfaction variable and some of the explanatory variables were recoded. Housing satisfaction is a self-reported perception. Respondents were asked to choose from a one-to-ten Likert-type scale that measures housing satisfaction, with one as the lowest score and ten the highest. This type of single measure of the respondent's perception of housing satisfaction may be more accurate than a weighted index of satisfaction, because weighting may be specific to each family (Galster, 1987; Morris, Crull, & Winter, 1976). For the purposes of the logistic analysis, the satisfaction scale was recoded into two categories: excellent (scale 10) and other (scale 1-9). The recoding tried to balance the highly skewed distribution of the number of households reporting high satisfaction and produced two similar sized groups.

The independent variables were calculated as follows: housing cost is the sum of monthly payments for the mortgage(s), installment loan(s) or contract(s), real estate taxes (including taxes on mobile homes or trailer sites if the sites are owned), property insurance, utilities (electricity, gas, water, and sewage disposal), fuel (oil, coal, kerosene, wood, etc.), and garbage collection. Housing cost also includes fees (condominium, mobile home, and homeowner associations) as well as routine maintenance costs. The housing cost-income ratio, as a cost index, equals the monthly housing costs multiplied by 12 and divided by the annual gross household income. The housing cost-income ratio reflects the proportion of the household's income used for housing-related expenditure in 1991.

Household income consists of gross income before any deductions and includes incomes of all occupants of the housing unit. The income in the AHS is based on the respondent's reply to questions on income for the 12 months before the interview and is the sum of the amounts reported for wage and salary income, net self-employment income, social security or railroad retirement income, public assistance or welfare pay-

ments, and all other money income. According to the AHS, income is generally under-reported (Hadden & Leger, 1990).

Housing quality was measured in terms of a housing deficiency index. This index is composed of 16 observations of dwelling features (e.g., plumbing, kitchen, physical structure, heating, electrical). The index included all deficiencies as defined by HUD (Appendix A) except common areas, because of the study's assumption that the dwelling's common areas features had limited contributions to the residential satisfaction of elderly homeowners. Components of the housing deficiency index are presented in Table 1. Each dwelling feature in the deficiency index was recoded into a dummy variable, and assigned a one if a deficiency reportedly existed, or a zero for "no deficiency reported." The housing deficiency index is the sum of those 16 individual observations for each household. A high deficiency index score reflects more problematic dwelling features and lower housing quality.

To simplify the descriptive analysis, some variables were recoded. The educational levels of the householders were recoded as five categories: one to eight years of schooling, nine to twelve years, some college (fifteen years or less), college graduates (sixteen years), and graduate school (seventeen years or more). The race variable was recoded as White and non-White; the latter includes Blacks, Native Americans, Asians, and others. According to the AHS, Hispanic minorities were separated and grouped into White and Black accordingly (Hadden & Leger, 1990). Marital status and region variables were recoded as dummies, married or not married, and southern or non-southern, respectively.

Methods of Analysis

Frequency distributions, Pearson correlations, and chi-square analyses were initially performed. Results of these analyses served to develop a description of elderly homeowners' housing satisfaction with respect to housing costs and quality.

A logit model (SAS Institute Inc., 1990) was used to test the housing satisfaction hypotheses. The logistic procedures fit linear logistic regression models for ordinal response data by the method of maximum likelihood. In this study, a logit model was established using SAS logistic procedures to estimate factors affecting the likelihood of elderly homeowners' housing satisfaction. The logit model implemented was:

$$P = \Pr (Y = 1 / X_1)$$

$$\text{Logit} (P) = \log [P / (1 - P)] = b_0 + b_1 X_1$$

where

$$P = \text{logit response function} = f (\text{independent variables}) = b_0 + b_1 X_1$$

Pr = probability

Y = 1, if elderly homeowners' residential satisfaction is at excellent level (i.e. 10), and 0 otherwise

X_1 = a vector of independent variables

b_0 = intercept

b_1 = a vector of coefficients associated with respective independent variables

Table 1. Coding of Housing Quality Deficiency Index

<u>Plumbing</u>		
(HOTPIP)	(1)	Does the house have hot and cold water? a. Yes...0 b. No...1
(TOILET)	(2)	Does the house have flush toilet for the household's use only? a. Yes...0 b. No...1
(PUBSEW)	(3)	Is the house connected to a public sewer? a. Yes...0 b. No...1
(NUMTLT)	(4)	How many times did the toilet breakdown last for 6 hours or more? a. < 3 ...0 b. => 3...1
<u>Kitchen</u>		
(SINK)	(5)	Does the house have a kitchen sink? a. Yes...0 b. No...1
(COOK)	(6)	Does the house have a cookstove or range with an oven? a. Yes...0 b. No...1
(REFR)	(7)	Does the household have a refrigerator? a. Yes...0 b. No...1
<u>Physical Structure</u>		
(CRACKS)	(8)	Does the house have open cracks or holes in the inside walls or ceilings? a. Yes...1 b. No...0
(HOLES)	(9)	Does the house have holes in the floors? a. Yes...1 b. No...0
(BIGP)	(10)	Does the house have any area of peeling paint or broken plaster bigger than 8 inches by 11 inches? a. Yes...1 b. No...0
(RATS)	(11)	In the last 3 months have you seen any rats or signs of rats in the building? a. Yes...1 b. No...0
<u>Heating</u>		
(HEQUIP)	(12)	What type of heating equipment is used most to heat the house? a. Central warm-air furnace...0 b. Steam/hot-water system...0 c. Electric heat pump...0 d. Other built-in electric units...0 e. Floor, wall, or other built-in hot-air heater without duct...0 f. Kerosene, gas, or oil heaters vented to the outside...0 g. Unvented gas, oil, or kerosene heaters...1 h. Portable electric heaters...0 i. Stoves...0 j. Fire places with inserts...0 k. Fire places with no inserts...0 l. Others...0 m. None...1
(NUMCOLD)	(13)	Have you had all heater(s) break down for 6 hours or more? a. Yes...1 b. No...0
<u>Electrical</u>		
(PLUGS)	(14)	Does every room have an electric outlet or wall plug that works? a. Yes...0 b. No...1
(NUMBLOW)	(15)	How many times did fuses blow in the last 3 months? a. Less than 3 times ...0 b. Three times or more...1
(NOWIRE)	(16)	Is all the wiring in the finished areas of your home concealed either in walls or metal coverings? a. Yes ...0 b. No...1

In addition to housing costs and housing quality as the independent variables, household income, family size, householders' age, educational level, and marital status were used as control variables and tested in the logit model. The model was tested by race and region in separate logistic procedures to assess whether elderly homeowners' housing satisfaction is different by racial and regional groups.

Results

Descriptive Analysis

Demographic characteristics of the sample by region and race are reported in Table 2. The southern region accounted for the greatest number of elderly homeowners represented in the sample (36.8%), while the West had the lowest representation, 17% (Table 2). Within each region, White elderly homeowners were an overwhelming majority (6,898 and 546 respectively). A greater percentage of non-White homeowners lived in metropolitan areas than did White homeowners for all four regions. More elderly homeowners in this sample were living in metro than in non-metro areas in the Northeast and West in 1991. There was no significant difference in gender distribution by race and region.

The average age of elderly householders was 73.7, with a standard deviation of 6.4. The oldest householder reporting was age 91. The greatest number of elderly householders was in the age category of 65 to 70, with at least one-third representation by both region and racial composition. Approximately 50% of the White and 40% of the non-White elderly householders were married in all four regions. Widowhood of elderly homeowners accounted for more than one third of the sample in all regions. Over one half of elderly homeowners had two or fewer persons in their households in all regions. More non-White elderly households were large (more than three members) than were White households.

Most elderly householders in the sample had at least an eighth-grade education. The mean number of years of education for the sample was 13.5. The mean household income reported for the 12-month period prior to the AHS interview for all elderly households was \$23,091. This amount represents 77% of the national median household income of \$29,943 in 1991. However, nearly one-third of elderly homeowners reported annual household incomes that were less than \$12,000 in all regions, of which 54% were Southern non-Whites. This finding is consistent with previous Census statistics that the poverty rate for the South remained the highest of the four regions in 1991 (U.S. Bureau of the Census, 1991).

Monthly housing costs averaged \$286 for the entire sample, with a standard deviation of \$195. Monthly housing costs were reportedly higher in the Northeast, where more than three fourths of both the White and the non-White homeowners spent more than \$200 a month. The lowest monthly housing costs were reported by elderly homeowners in the South. The average cost-income ratio for the sample was 23.04% with a standard deviation of 26.71%, implying the diversified income and housing cost distributions among the sample and respective regions.

Table 2. Demographic Characteristics of Elderly Homeowners by Race and Region

Variables	Northeast (n=1497)		Midwest (n=1939)		South (n=2741)		West (n=1267)	
	White % (n=1425)	Non-White % (n=72)	White % (n=1857)	Non-White % (n=82)	White % (n=2421)	Non-White % (n=320)	White % (n=1195)	Non-White % (n=72)
<u>Geographic Locations</u>								
metro	60.8	97.2	44.6	86.6	41.5	45.6	62.8	75.0
non-metro	39.2	2.8	55.4	13.4	58.5	54.4	37.2	25.0
<u>Householder Gender</u>								
male	59.6	48.6	62.0	53.7	60.1	50.0	57.8	59.7
female	40.4	51.4	38.0	46.3	39.9	50.0	42.2	40.3
<u>Householder Age</u>								
65 - 70	39.6	51.4	36.5	36.6	37.4	37.5	37.5	41.7
71 - 75	25.1	22.2	26.5	24.4	27.3	2.8	26.0	26.4
76 - 80	21.0	5.6	19.9	22.0	18.7	20.3	19.4	16.7
80 +	14.3	20.8	17.1	17.1	16.6	19.4	17.1	15.3
<u>Marital Status</u>								
married	52.8	41.7	53.5	39.0	51.5	41.6	50.8	43.1
widowed	37.4	38.9	38.7	45.1	40.0	46.9	39.8	43.0
divorced	3.7	5.6	4.3	7.3	4.5	5.9	6.4	9.7
separated	0.7	6.9	0.2	3.7	1.0	1.9	0.6	1.4
never married	5.3	6.9	3.3	4.9	3.0	3.8	2.3	2.8
<u>Family Size</u>								
one person	34.7	29.2	38.4	32.9	36.8	33.1	36.7	37.5
2 persons	52.6	36.1	53.3	37.8	54.2	40.6	53.2	40.3
3 persons	9.0	19.4	6.0	19.5	6.5	14.1	7.1	8.3
4 + persons	3.8	15.3	2.4	9.8	2.5	12.2	3.0	13.9
<u>Householder Education</u>								
0 - 8 years	18.9	20.8	23.5	34.1	25.1	53.8	14.6	26.4
9 - 12 years	56.0	55.6	54.6	45.1	47.9	34.7	46.7	47.2
some college	10.2	13.9	10.9	7.3	12.8	4.4	19.1	18.1
college grad.	8.8	6.9	6.2	6.1	8.1	2.8	9.8	5.6
graduate sch.	6.0	2.8	4.8	7.3	6.2	4.4	9.8	2.8

(table continues)

Table 2. (continued)

Variables	Northeast (n=1497)		Midwest (n=1939)		South (n=2741)		West (n=1267)	
	White % (n=1425)	Non-White % (n=72)	White % (n=1857)	Non-White % (n=82)	White % (n=2421)	Non-White % (n=320)	White % (n=1195)	Non-White % (n=72)
Household Income (\$)								
1,000-12,000	28.8	40.3	31.3	46.3	37.8	54.4	26.9	23.6
12,001-20,000	25.5	13.9	26.0	20.7	21.9	20.9	22.5	26.4
20,001-35,000	26.1	29.2	29.5	20.7	25.7	15.6	29.1	27.8
35,001-50,000	9.5	6.9	6.8	3.7	7.7	5.3	9.0	12.5
> 50,001	10.1	9.7	6.4	8.5	6.9	3.8	12.5	9.7
Monthly Housing Costs (\$)								
51 - 100	0.6	1.4	2.4	4.9	9.5	13.8	4.9	6.9
101 - 200	14.9	19.4	35.9	25.6	45.2	44.4	35.1	30.6
201 - 300	30.2	25.0	33.8	34.1	24.6	20.9	26.5	22.2
301 - 500	22.7	22.2	13.7	15.9	8.7	9.7	13.0	4.2
> 500	31.7	32.0	14.3	19.4	12.0	11.3	20.4	36.1
Housing Satisfaction Score (1 - 10)								
1(worst)	0.1	-	0.2	-	0.4	1.3	0.4	-
2	0.1	-	0.1	-	0.2	0.6	0.3	-
3	0.1	-	0.3	1.2	0.4	0.9	0.2	4.2
4	0.2	-	0.3	-	0.8	0.6	0.3	1.4
5	4.5	4.2	5.5	7.3	6.0	13.1	4.1	9.7
6	2.5	1.4	2.6	3.7	3.1	5.0	3.1	4.2
7	6.2	9.7	7.1	6.1	6.6	5.0	5.9	11.0
8	18.7	26.4	21.2	23.2	19.2	19.4	20.8	11.1
9	14.7	16.7	14.5	11.0	13.7	10.3	15.9	18.1
10 (best)	53.0	41.7	48.1	47.6	49.6	43.8	49.2	40.3

Source: 1991 American Housing Survey

The distribution of housing satisfaction scores was highly skewed; there was an average satisfaction score of 8.8 and a standard deviation of 1.6. Over 48% of White homeowners and nearly 40% of non-White householders reported the highest satisfaction levels (score 10) in all regions (Table 2). Very few householders reported low satisfaction levels (score 1-4) with their housing.

Table 3 provides the distribution of the housing quality deficiency index by region and race. The majority of elderly homeowners reported no more than one point as their deficiency index score, meaning that very few of their dwelling features were deficient. More elderly homeowners living in the South reported higher housing quality deficiency index scores than did those in other regions. As shown in the lower portion of Table 3, PUBSEW (no public sewer) was the deficiency most frequently reported by subjects in all regions. RAT (see rats in building) was relatively more frequently reported by non-White homeowners in the Northeast and Midwest regions, and HEQUIP (no heating equipment used to heat house) occurred more frequently with non-White owners in the South and West regions.

Hypotheses Test

A logistic regression model was used to test the research hypotheses. Elderly homeowners' housing satisfaction levels, as the response variable, were collapsed and dichotomized as either *excellent* (coded as 1) or *other* (coded as 0). The explanatory variables in the model were housing quality, monthly housing costs, number of persons in the household, householders' age, years of education, and marital status. The regional (southern or non-southern) and racial (White or non-White) differences were tested by the same model, but in separate procedures. The odds ratio of reporting excellent housing satisfaction level was used to interpret the magnitude of the logit odds. The odds ratio was computed by taking the natural anti-logarithm of each log odds (DeMairs, 1995). Details of the results are reported in Tables 4 and 5, respectively. The probability of accepting a research hypothesis was specified at the .05 level.

Housing quality, in terms of the housing deficiency index, was significantly related to housing satisfaction of both White and non-White elderly households (Table 4). The lower the quality deficiency index score, the higher the housing quality, and the more likely that both White and non-White elderly homeowners perceived an excellent level of housing satisfaction than did those with higher quality deficiency index scores and lower housing quality. The odds of reporting excellent housing satisfaction are about .84 times as high for the White owners with low quality deficiency as are the odds for those with high quality deficiency. For the same quality variable, the odds of reporting excellent housing satisfaction is .70 times as high for non-White owners with low quality deficiency as the odds are for those with high quality deficiency. The odds ratios indicate higher satisfaction levels for both Whites and non-Whites with lower quality deficiencies.

Housing costs were positively associated with housing satisfaction only for White elderly homeowners. White elderly homeowners with higher monthly housing costs

Table 3. Distribution of Housing Deficiency Index

Variables	Northeast (n=1497)		Midwest (n=1939)		South (n=2741)		West (n=1267)	
	White % (n=1425)	Non-White % (n=72)	White % (n=1857)	Non-White % (n=82)	White % (n=2421)	Non-White % (n=320)	White % (n=1195)	Non-White % (n=72)
Housing Deficiency Index (0-16)								
0 (highest quality)	59.3	70.8	62.3	73.2	48.6	35.6	61.3	61.1
1	34.9	20.8	32.7	22.0	38.7	33.8	32.1	29.2
2	4.6	5.6	3.8	3.7	9.1	15.6	5.4	6.9
3	0.9	2.8	0.9	1.2	2.4	7.2	0.8	-
4	0.2	-	0.2	-	0.7	4.1	0.3	2.8
5	0.1	-	0.1	-	0.5	3.4	0.1	-
6	-	-	0.1	-	-	0.3	-	-
7	-	-	-	-	-	-	-	-
8 (lowest quality)	-	-	-	-	-	0.3	-	-
HOTPIP	0.1	0.0	0.1	0.0	0.2	1.6	0.0	0.0
TOILET	1.8	4.2	2.3	1.2	2.7	3.4	2.6	2.8
PUBSEW	32.6	2.8	29.8	7.3	41.6	40.3	27.9	12.5
NUMTLT	0.1	0.0	0.1	0.0	0.3	0.9	0.0	0.0
SINK	0.4	1.4	0.2	0.0	0.3	1.3	0.3	0.0
COOK	1.7	4.2	1.2	1.2	2.4	3.1	2.8	0.0
REFR	0.1	0.0	0.1	0.0	0.0	0.6	0.0	1.4
CRACKS	2.0	5.6	2.0	3.7	3.1	10.0	2.8	6.9
HOLES	0.5	1.4	0.4	0.0	0.6	3.4	0.6	1.4
BIGP	1.8	5.6	2.3	6.1	3.2	10.6	2.7	2.8
RATS	0.8	12.5	0.4	9.8	3.6	15.0	1.3	6.9
HEQUIP	0.5	1.4	0.5	0.0	6.7	22.2	1.2	18.1
NUMCOLD	1.6	0.0	1.2	0.0	0.4	1.9	0.9	0.0
PLUGS	1.8	1.4	1.9	1.2	1.7	4.7	1.1	0.0
NUMBLOW	0.7	0.0	0.8	1.2	1.3	2.5	1.2	0.0
NOWIRE	1.6	0.0	1.1	1.2	1.3	2.8	1.8	1.4

Source: 1991 American Housing Survey

Table 4. Logistic Analysis of Elderly Homeowners' Housing Satisfaction by Race

Variables	White Homeowners (n=6,898)			Non-White Homeowners (n=546)		
	Parameter Estimate	Wald χ^2	Odds Ratio	Parameter Estimate	Wald χ^2	Odds Ratio
Intercept	-1.200	12.226***		-1.385	1.446	
Quality Deficiency	-.175	26.451***	.839	-.358	17.139***	.699
Housing Costs	.809	32.877***	2.246	-.381	.668	.683
Household Income	.244	2.870	1.276	.005	.000	1.005
Householder Age	.017	18.948***	1.017	.024	2.960	1.024
Household Size	-.159	12.036***	.853	.022	.041	1.022
Head Education	-.009	1.179	.991	-.020	.617	.981
Head Married	.183	8.918**	1.201	-.188	.933	.829
- 2 Log d.f.	104.699***	24.108*				
	7	7				

* p < .05, ** p < .01, *** p < .001

Source: 1991 American Housing Survey

were more satisfied with their residence than were those paying less for housing. High expenditures on housing maintenance could be positively related to higher levels of residential satisfaction. The odds of reporting excellent housing satisfaction are 2.25 times as high for those White homeowners with higher housing costs as for those Whites with lower housing costs. Based on the above tests, the hypothesis that housing costs and housing quality related to the housing satisfaction of elderly homeowners by race can be partially accepted.

For the model test by region (Table 5), both housing quality and monthly housing costs were significantly related to housing satisfaction for both southern and non-southern regions. The lower the quality deficiency index, the higher the housing quality, and the more likely that elderly homeowners have a higher level of housing satisfaction than those with higher quality deficiency index scores and lower housing quality. For homeowners in both southern and non-southern regions, the odds of reporting excellent housing satisfaction for those with low deficiency scores are about 80% of the odds for those with high deficiency scores. The lower the monthly housing costs, the more likely elderly households did not report housing satisfaction as excellent in both southern and non-southern regions, and the opposite is also true. The odds of reporting

Table 5. Logistic Analysis of Elderly Homeowners' Housing Satisfaction by Region

Variables	Southern Homeowners (n=2,741)			Non-Southern Homeowners (n=4,703)		
	Parameter Estimate	Wald c ²	Odds Ratio	Parameter Estimate	Wald c ²	Odds Ratio
Intercept	-1.140	4.528*		-1.276	9.339**	
Quality Deficiency	-.221	23.866***	.802	-.183	16.512***	.833
Housing Costs	1.109	19.305***	3.031	.558	11.920***	1.747
Household Income	.315	1.761	1.370	.198	1.300	1.219
Householder Age	.017	7.444**	1.017	.0183	14.370***	1.018
Household Size	-.152	5.069*	.859	-.134	6.497*	.875
Head Education	-.011	.778	.989	-.008	.670	.992
Head Married	.058	.385	1.060	.212	8.546**	1.236
- 2 Log	75.276***	53.064***				
d.f.	7	7				

* p < .05, ** p < .01, *** p < .001

Source: 1991 American Housing Survey

excellent housing satisfaction are 3.03 times as high for higher-cost homeowners as for low-cost homeowners in the southern region, while the same odds in the non-southern region are only 1.75 times as high for owners paying higher housing costs as the odds for those paying lower housing costs. The implication is that housing cost has a greater influence on housing satisfaction in the southern than the non-southern region. The hypothesis that housing costs and housing quality are related to housing satisfaction of elderly homeowners by region can be accepted.

The logistic model test also identified variables that were significant predictors of elderly homeowners' housing satisfaction by race and region. By racial differences, age and marital status were positively related with housing satisfaction for White households only (Table 4); the older the householder, the higher the satisfaction level for White homeowners. This result may suggest that older homeowners tend to have lower residential expectations and to perceive their residences more positively. Married White elderly homeowners were more likely to have a higher level of housing satisfaction than were those who were single. White elderly householders' household size was a significant predictor of housing satisfaction (Table 4). The fewer people living in the household, the higher the level of housing satisfaction for elderly homeowner. Re-

gional comparison shows a high proportion of satisfied White homeowners in both southern and non-southern regions (Table 5). For elderly homeowners living in non-southern regions, married householders were more satisfied with their housing condition than were non-married householders (Table 5). Housing satisfaction was found to be positively related to householder's age and negatively related to household size in both regions. For elderly homeowners in either region, the smaller the household size, the more housing satisfaction, and the older the householders, the higher the levels of residential satisfaction.

The tests of the logistic models by both race and region were significant, with -2 log likelihood at the $p < .001$ level (Tables 4 & 5). Alternative logistic procedures with step-wise inclusion as well as probit procedure with logistic option were used during the analyses, and similar results were found.

Summary and Discussion

This study examined the relationship between housing costs and quality to the housing satisfaction of elderly homeowners, using the 1991 American Housing Survey data. The study found that the majority of elderly homeowners were highly satisfied with their residences, even though their housing had deficiencies, and that the influence of housing quality on housing satisfaction was significant and positive. Racial differences were also found to be significantly associated with housing satisfaction. White elderly homeowners who paid more for housing costs reported greater satisfaction with their residences than did those who paid less, while married White householders enjoyed a higher level of housing satisfaction than did single ones. However, elderly White householders' housing satisfaction level dropped as the number of people in the household increased. In both southern and non-southern regions, housing quality was negatively associated with housing satisfaction, while housing costs were positively associated.

The study revealed diverse income and housing cost distributions among elderly homeowners. Given the wide spread housing cost-income ratio distribution (with the mean at 23% and a standard deviation of 26.7%), some elderly homeowners (21.3%) spent 30% or more of their income for housing, exceeding the housing affordability threshold set by HUD. Since most elderly homeowners own their homes debt-free, a housing cost-income ratio of more than 20% is considered a financial burden; thus, housing costs would be expected to influence housing satisfaction. On the other hand, many older homeowners are cash-poor and house-rich. For these individuals, the housing cost-income ratio may not necessarily reflect an accurate housing cost burden.

The high level of housing satisfaction reported in this study may be associated with the age and homeownership status of the population under study. Elderly homeowners, especially non-White householders with increased age, reduced income, and declining health, often tend to positively perceive their housing conditions. This finding is consistent with previous research that housing expectations of many elderly homeowners become relatively lower, and that their housing satisfaction should thus be treated with

caution (Lawton, 1985). It is possible that many elderly homeowners unrealistically perceive their housing as suitable.

High levels of housing satisfaction would be a strong indicator of the desire to age-in-place. Therefore, it is vital for public policy makers, advisors, and advocates to understand the relationship between perceived housing quality and costs and housing satisfaction as reported by older people. While low numbers of structural deficiencies and high levels of housing satisfaction are reported, caution should be taken in evaluating the existing housing conditions of older persons. Based on the findings of this study, housing quality was one of the most influential factors on housing satisfaction, but since housing expectations are low and homeownership has a great influence on housing satisfaction, self-reporting evaluations by older persons may not accurately measure their housing quality deficiencies. The objective indicators of housing quality are reflected in the subjective evaluation of elderly residents (Vliet, 1992). Policies and programs to improve the quality of housing for older persons should take these variables into account.

Implications and Limitations

The housing quality deficiency index in this study was measured according to the HUD (1981) definition of quality deficiency. Each deficiency feature included was given equal weight. This measurement makes no ranking judgment about which problems are more serious (Golant & La Greca, 1995). Each of the most commonly occurring deficiencies in this study, be they toilet breakdown or fuses blown, contributed equally to the housing quality deficiencies index. A limitation of this study is that this simplified measurement of housing quality deficiency may not accurately measure the housing quality deficiency of elderly homeowners. Many calibrations to the HUD definition of deficiency have been made since the early 1980s, and the drawbacks have been explored and exposed. The need for reformulating the quality definition cannot be over emphasized.

The sample used in this study included only homeowners with householders aged 65 and older. To further explore the influence that housing cost and quality have on housing satisfaction, future studies might focus on an examination and comparison of elderly homeowners with non-elderly homeowners. Exploring households that contain older person(s), instead of focusing exclusively on elderly homeowners, could lead to new information concerning the housing needs of households with varied age compositions. A longitudinal study of housing cost comparisons between elderly homeowners and non-homeowners using multiple-years AHS data would also help expand and refine housing satisfaction theories.

Racially, there was disparity in housing quality and cost that affected housing satisfaction. Again, as discussed above, reports of high satisfaction may camouflage real structural conditions. Evaluation of structural deficiencies of older homeowners' dwellings may need to be differently assessed to insure a true evaluation, so that the environment of older persons is safe and sanitary, particularly for the poor.

Methods of determining housing cost burdens for elderly homeowners may need rethinking for a more accurate measure of the financial impact that homeownership has on those with restricted incomes. While recent programs, such as home equity conversion, address this problem, successful implementation and expansion depend on acceptance by both lending institutions and consumers. Educating consumers about options offered in home equity conversion programs should perhaps be done while they are still young; since home equity conversion decreases the inheritance remaining in the estate, changing attitudes and values will be critical issues, which must be addressed to increase the acceptance of this program. Other innovative programs that support options allowing for aging-in-place also need to be developed to offer relief to the financially burdened older homeowner.

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Appendix A Deficiencies That Cause a Housing Unit to be Judged Physically Inadequate: 1981 HUD Definition

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|---------------------------|------|--|
| <u>Plumbing</u> | (1) | <i>Lacks or shares some or all plumbing facilities.</i>
The unit must have hot and cold piped water, a flush toilet, and a bathtub or shower - all inside the structure and for the exclusive use of the unit. |
| | (2) | <i>Lacks adequate provision for sewage disposal.</i>
The unit must be connected to a public sewer, septic tank, cesspool, or chemical toilet. |
| | (3) | <i>Had breakdown of flush toilet for six consecutive hours or longer, three or more times during last 90 days.</i> |
| <u>Kitchen</u> | (4) | <i>Lacks or shares some or all kitchen facilities.</i>
The unit must have an installed sink with piped water, a range or cookstove, and a mechanical refrigerator - all inside the unit and for the exclusive use of the unit. |
| <u>Physical Structure</u> | (5) | <i>Has three or more of six structural problems.</i>
Such as leaking roof; open cracks or holds in interior walls or ceiling; holes in interior floors; peeling paint or broken plaster over one square foot in an interior wall or ceiling; evidence of rats or mice in the last 90 days; and leaks in basement. |
| <u>Common Area</u> | (6) | <i>Has three or more of four common area problems.</i>
Such as no light fixtures (or no working light fixture) in common hallway; loose, broken or missing steps on common stairways; loose or missing stair railings; no elevator in building. |
| <u>Heating</u> | (7) | <i>Has unvented room heaters which burn oil or gas.</i>
If the unit is heated mainly by room heaters burning gas, oil or kerosene, the heaters must have a flue or vent. |
| | (8) | <i>Had breakdown of heating equipment for six consecutive hours or longer, during the past winter.</i> |
| <u>Electrical</u> | (9) | <i>Lacks electricity.</i> |
| | (10) | <i>Has three out of three signs of electrical inadequacy.</i>
One or more rooms without a working wall outlet; fuses blown or circuit breakers tripped three or more times during the last 90 days; exposed wiring in the unit. |
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Source: Clemmer, R. B., & Simonson, J. C. (1983). Trends in Substandard Housing, 1949 -1980. *AREUEA Journal*, 10(4), 442-464.