

Age, income, net worth, housing quality
and satisfaction

by

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CHAPTER I. INTRODUCTION

Purpose

The purpose of this thesis is to examine the relationship between the housing quality and the housing satisfaction of home owners in the context of variations in age, income, and net worth of the household. The purpose is accomplished using interview data from a probability sample of 664 home-owning households in Iowa.

Review of Literature

Housing is frequently viewed as providing shelter and protection. However, the importance of housing reaches far beyond this function (Morris & Winter, 1978). Housing can provide a setting for a number of social and biological processes that sustain life, and the status of a family can be characterized to a wider community and to the family itself. Residential satisfaction has been shown to be positively associated with objective quality of housing (Harris, 1976). Each is an aspect of generalized well-being in its subjective and objective versions respectively (Lawton, 1978; Campbell et al., 1976).

The topics that are of importance in this thesis are the effects of age of the head of the household, income and net worth on housing quality and satisfaction. According to Chiswick and

O'Neill (1977) income and net worth are useful indicators of the distribution of economic well-being. A study of only homeowners can reveal the wealth of households whereas omitting renters permits the study of the set of respondents who are more homogenous with respect to the contents of their net worth. Consumers' income and net worth are determined by several factors such as occupational status, employment status, education, age and marital status. A more detailed discussion of income and net worth in relation to housing quality and satisfaction is presented later along with the other variables such as household size, marital status, sex of the head of the household, education of the head of the household, and employment status of the head of the household.

Housing satisfaction

In most models, housing satisfaction is used as an intervening variable in that the link between household characteristics and mobility is housing satisfaction (Speare, 1974; Morris et al., 1976; Butler et al., 1969; and Bross, 1975; Winter & Morris, 1979; Meeks, 1980). Speare (1974), in treating housing satisfaction as an intervening variable between mobility and selected housing and household characteristics, stated:

Residential satisfaction is assumed to depend on characteristics and aspirations of the household, characteristics of

current locations, and "social bonds"
between household members and other
consumers [of the neighborhood] [p. 176].

He found that of all the variables related to satisfaction (age of head, age of the dwelling unit, tenure, crowding, and neighborhood friendship index) only tenure and age of the dwelling unit were related directly to the desire to move or actual mobility (Speare, 1974).

In this thesis, housing satisfaction is being used directly as the dependent variable rather than as an intervening variable. Housing satisfaction can be viewed as a state reflecting the level of contentment with current housing conditions (Morris & Winter, 1978). Satisfaction with housing refers to the continuum of satisfaction that ranges from very dissatisfied to very satisfied (Morris & Winter, 1978).

Residential satisfaction has been often treated as one of a number of indicators of "Quality of Life" (Snider, 1980). Housing satisfaction is positively related to the quality of life (Campbell et al., 1976; Bharadwaj & Wilkening, 1977). It has also been found that residential satisfaction is at least moderately related to a more generalized level of life satisfaction (Carp, 1966; Lawton & Cohen, 1974; McAuley, 1977; Toseland & Rasch, 1978). Residential satisfaction serves as a component of life satisfaction which validates the importance of housing satisfaction. The relationship between these two variables,

however, will not be analyzed in this thesis. Rather, on the assumption that the quality of life research has shown the value of residential satisfaction, housing satisfaction is made the center of attention.

Rossi's (1955) complaints index indicated a method of measuring satisfaction which includes various housing characteristics that are positively interrelated with one another. Rossi (1955) formulated a "Complaints Index" stating that:

Each household faces a particular kind of housing situation. Dwelling units vary in their size, design, utilities and conveniences furnished, and their ecological setting, etc. Households can therefore be expected to vary in the extent to which they see their present dwelling as fulfilling or not fulfilling their housing requirements and needs as they view them [pp. 80-81].

Owners are more likely to complain about their neighborhood while renters are more likely to complain about housing costs (Rossi, 1955). Foote, Abu-Lughod, Foley, and Winnick (1960) found that renters generally have higher levels of dissatisfaction, especially in terms of dissatisfaction with tenure.

Tenure is the mode of holding or possessing housing. The two common types of tenure are ownership and rental (Morris & Winter, 1978). Ownership is "owner-occupied" if the owner(s) lives in the unit, even if it is mortgaged. All other occupied units are treated as "renter-occupied," including those for which cash rents are paid as well as those that are free and those where rent as

received in-kind transfers are used (Meeks, 1980).

Researchers use various kinds of housing factors to explain housing satisfaction for renters and homeowners. According to O'Bryant and Wolf (1983), physical housing characteristics were found to be better predictors of housing satisfaction for renters than for homeowners.

Housing quality and satisfaction

Most aspects of housing quality indices are significantly and independently associated with housing satisfaction (Harris, 1976). Housing quality affects housing satisfaction in a positive way (Harris, 1976; O'Bryant & Wolf, 1983). Therefore, the higher the quality of family housing, the more satisfied the residents are with their housing.

Objective housing quality can be viewed in terms of the objective well-being achieved, and satisfaction can be viewed in terms of subjective well-being with the objective levels achieved (Morris & Winter, 1978). Thus, both are equally important, for it is the subjective reaction to the attained objective level of housing that serves as motivation to improve well-being.

Morris and Winter (1978) indicate that the subjective aspect of well-being achieved is represented by satisfaction reported and the objective well-being is represented in terms of unmet needs where unmet needs can be classified in terms of normative

deficits. Because subjective well-being is recognized in the satisfaction reported, it is not actually stated by Morris and Winter (1978) that subjective measures of well-being is related to the objective measures of well-being within the study.

Housing satisfaction and the independent variables

Satisfaction and age of the head Housing generally improves as families get older. In other words, it would be expected for older heads of households to be more satisfied with their housing than younger heads of households. According to Onibokun (1976), there is no correlation between age and housing satisfaction. The reason could possibly be because most of Onibokun's sample were young, middle aged adults who lived in public housing.

In other studies, it was found that age was significantly and positively related to housing satisfaction (Lane & Kinsey, 1980; Myers, 1982; O'Bryant, 1983). The reason could possibly be that home ownership and other desired housing characteristics are achieved during the middle and later years instead of the earlier years of life. Therefore, helping persons to achieve a sense of progress and advancement within their life span seems relevant enough for consideration (Myers, 1982). In the study by O'Bryant (1982), older persons reported being more satisfied with their housing than any other age group. Further, the elderly are more

likely to be homeowners than are younger cohorts (U.S.D.H.U.D., 1979, p. 16). Persons over 60 years of age are "attached" to their homes, and their high levels of satisfaction could possibly be a result of subjective interpretations rather than objective ones (Carp, 1975; Lawton, 1980b).

Satisfaction and income Households with high incomes are more likely to have high quality homes than are low-income households, which in turn increases the level of satisfaction. A nationwide survey by Davis and Fine-Davis (1981) indicated high-income households to be more satisfied with their housing and neighborhoods than are low-income households. Onibokun's (1976) study showed the opposite. In other studies, (Myers, 1982; Crull, 1979; and Lawton, 1980a) income was found to be a weak predictor of housing satisfaction.

Satisfaction and net worth A major concern of home buyers is the opportunity to build equity and add to personal wealth (Hempel & Tucker, 1979). Equity in a home is the single largest asset of many older persons (Scholen & Chen, 1980; Struyck & Soldo, 1980). The combination of substantial house values and the absence of mortgage indebtedness places a substantial portion of the elderly in a strong asset position. Approximately 51 percent of all elderly homeowners own debt free houses valued over \$25,000 (U.S.D.H.U.D., 1979, p. 30). Homeowners are interested in both

the investment and consumption value of the home, and they are likely to be more satisfied with their housing as its value increases (Lane & Kinsey, 1980).

Several measures have been used to assess the market value of housing. Property tax was found to be a better measure of housing value and housing expenditure than the total value of the home; higher levels of expenditure for property taxes significantly increased the probability of housing satisfaction for homeowners (Lane & Kinsey, 1980). The relationship between the market value of the dwelling and the satisfaction with the dwelling proved to be weak (Campbell et al., 1976).

Housing satisfaction and the control variables

Satisfaction and household size For many families, crowding (deficit of space) and family size are associated with low levels of satisfaction. Foote, Abu-Lughod, Foley and Winnick (1960) indicate that the majority of families that are made up of four or fewer persons and homeowners were satisfied with their housing. Among those families who were dissatisfied with their housing, space is the primary complaint (Foote et al., 1960; Rossi, 1955).

Crull (1979) indicates that household size has a negative effect on housing satisfaction. Other literature indicates that household size has positive effects on housing satisfaction

(Hourihan, 1984; Rogers and Nikkel, 1979). Having a large number of persons in a household lowers a persons' level of housing satisfaction (Onibokun, 1976; Crull, 1979).

Satisfaction and marital status Research has shown no difference between the levels of housing satisfaction of female-headed and jointly-headed households. Both groups have been found to be very satisfied with their housing (Winter & Morris, 1982). Onibokun's (1976) sample of young and middle aged households indicates that one-parent families have a significantly lower level of satisfaction than do two-parent families.

Satisfaction and sex of the head Lane and Kinsey (1980) indicate that male heads of households who are owners have a lower probability of reported satisfaction with housing than female heads who are homeowners. Winter and Morris's (1982) research has shown that the levels of housing satisfaction for female-headed and jointly-headed households are very much the same.

Satisfaction and education of the head Lane and Kinsey (1980) found education to have a positive effect on housing satisfaction for renters, but not for homeowners. Some persons with high levels of education probably decided to become renters instead of homeowners because of their lifestyle preference. Other research shows that the more education, the lower the level of housing satisfaction (Onibokun, 1976).

Satisfaction and employment status Employment serves as an indicator of housing satisfaction. Snider's (1980) study is based on families that reside in multiple-family accommodations of some kind. In this study he found families receiving federal assistance were less satisfied with their housing than the families whose income source is employment. Therefore, it is apparent that no two families evaluate the same unit design of a dwelling in the same way.

Housing quality

The belief that good quality housing is recognized as an inalienable right led to the first federally assisted housing, the Housing Act of 1937 (Lawton, 1980a). Housing quality as defined by Morris and Winter (1978) depends upon the presence of characteristics of dwelling units that contribute to the desirability of a dwelling unit through the subjective reactions of families to those characteristics that are determined by the development of consumer preferences. Characteristics are defined as "the subset of the attributes possessed by housing or other goods that enter into consumer preference development and consumer decision making" (Morris & Winter, 1978, p. 143).

The way in which housing quality contributes to the desirability of residence can be viewed from three different perspectives: those of an objective observer, an occupant family,

and other relevant families. As a result, the definition and indicators of housing quality require knowledge of the objective attributes that stimulate the subjective reactions of families to the characteristics of a dwelling (Morris & Winter, 1978).

Many previous attempts have been made to measure housing quality. The earliest large scale studies conducted were the Real Property Surveys (U.S. Works Progress Administration, 1935).

The Real Property Survey was developed by Federal Agencies for general use in local housing surveys and in work relief projects. Characteristics of the dwelling unit such as value and presence or absence of central heat were combined with characteristics of the household which include income and tenure, into an overall rating. The quality of the information varies as the method was gathered through local agencies. As a result, the value of the scale as a research instrument was reduced (U.S.W.P.A., 1935).

Various attempts have been made to measure housing quality. The most extensive measure of housing quality still in use is possibly the one developed by the American Public Health Association (A.P.H.A.), which was developed to aid planners in specifying potential problem areas that may develop in cities (A.P.H.A., 1945).

A discovery of all the characteristics that people value could be used in formulating a scale that would represent housing

quality in a comprehensive manner (Harris, 1976). It seems feasible to incorporate the subjective reactions of families as they view housing quality into a housing quality measure. The quality of housing constitutes a combination of desired characteristics. There are various combinations of prices that must be paid in order to purchase a dwelling unit with specific characteristics. The actual market prices of the characteristics reflect quality indirectly through the prices consumers are willing to pay. Therefore, "a family is most likely to choose housing with a combination of characteristics that uses all their housing money and gives the maximum satisfaction for that amount of money" (Morris & Winter, 1978, p.129).

One of the most direct indexes of the desirability of housing is market value (the current value of a housing unit on an open market; what a house sells for). Market value is perhaps the best single indicator of quality for owner-occupant dwellings that combines the elements that contribute to quality (Morris & Winter, 1978; Kain & Quigley, 1970). When and if quality is soundly measured, market value should be considered as a reflection of quality. Other studies indicate that the number of bathrooms and the presence of central heating systems are the two strongest indicators of quality (Lawton, 1980a).

In the study by Hempel and Tucker (1979), physical measures of dilapidation and plumbing have been the main statistical

indicators of housing quality. In the 1970 Census of Housing, only plumbing was used. It should be noted that studies on the measurement of housing quality in the U.S. Census was abandoned by the Census Bureau prior to the 1970 Census (Schucany et al., 1979). A measure of housing quality needs to reflect the consumer interest instead of imposed judgements made by housing experts since the consumers are the ones that will be purchasing and living in various kinds of housing (Myers, 1982).

Housing quality and the independent variables

Quality and age of the head In the literature reviewed, age of the head of the household was not correlated or even mentioned in connection with housing quality. However, it was indicated that the elderly live in housing that is older, cheaper, and of lesser quality than do younger households (Beyer, 1965 and U.S.D.H.U.D., 1979).

Quality and income There is a weak but positive relationship between housing quality and income, which implies that low income is associated with low-quality housing (Lawton, 1980a; U.S.D.H.U.D., 1979; Harris, 1976). According to Goodman (1978), income has a positive effect on housing quality.

Quality and net worth There is no literature relating quality and net worth. However, it seems feasible to make an assumption that net worth is related to quality. The reason is that consumers with high quality homes are more likely to have a substantial net worth because homeownership is a large form of asset.

Housing quality and the control variables

Quality and household size Goodman (1978) indicated that household size has a positive effect on housing quality, whereas in the study by Harris (1976) the opposite was found. The contradiction is possibly because individuals use different housing quality indicators in their study and apply them to different populations.

Quality and marital status Being married has a positive effect on the level of housing quality (Harris, 1976). Persons who are single and have never been married tend to have lower levels of housing quality than do those who are married.

Quality and sex of the head According to Harris (1976), sex head of household was found to have a positive effect on housing quality levels. Male-headed households have higher quality levels relative to female-headed households.

Quality and education of the head Goodman (1978)

indicates that education could influence housing quality through at least two channels, which are 1) having differences in taste for housing consumption relative to other goods and services at different educational levels; and 2) through various educational levels that might be correlated with elements of long term or permanent income that are not reflected in the current annual income. Thus, as education increases so does the achieved quality of housing (Harris, 1976).

Quality and employment status The quality of housing

varies for individuals depending on their employment status. Harris's (1976) study indicates that being employed contributes to higher levels of housing quality.

Theoretical hypotheses

Theoretical hypotheses derived from the review of literature concerning the relationships among the independent, control, intervening, and dependent variables will be presented. In Figure 1, the following hypotheses are formulated:

- 1- Age of the head of the household is positively related to housing quality.
- 2- Income is positively related to housing quality.
- 3- Net worth is positively related to housing quality.

- 4- Sex of the head of the household is positively associated with housing quality.
- 5- Household size is positively related to housing quality.
- 6- Marital status is positively related to housing quality.
- 7- Education of the head of the household is positively associated with housing quality.
- 8- Employment status is positively related to housing quality.
- 9- Age of the head of the household is positively associated with housing satisfaction.
- 10- Income is positively related to housing satisfaction.
- 11- Net worth is positively associated with housing satisfaction.
- 12- Housing quality is positively related to housing satisfaction.
- 13- Sex of the head of the household is positively associated with housing satisfaction.
- 14- Household size is positively related to housing satisfaction.
- 15- Marital status is positively related to housing satisfaction.
- 16- Education of the head of the household is positively associated with housing satisfaction.
- 17- Employment status is positively related to housing satisfaction.

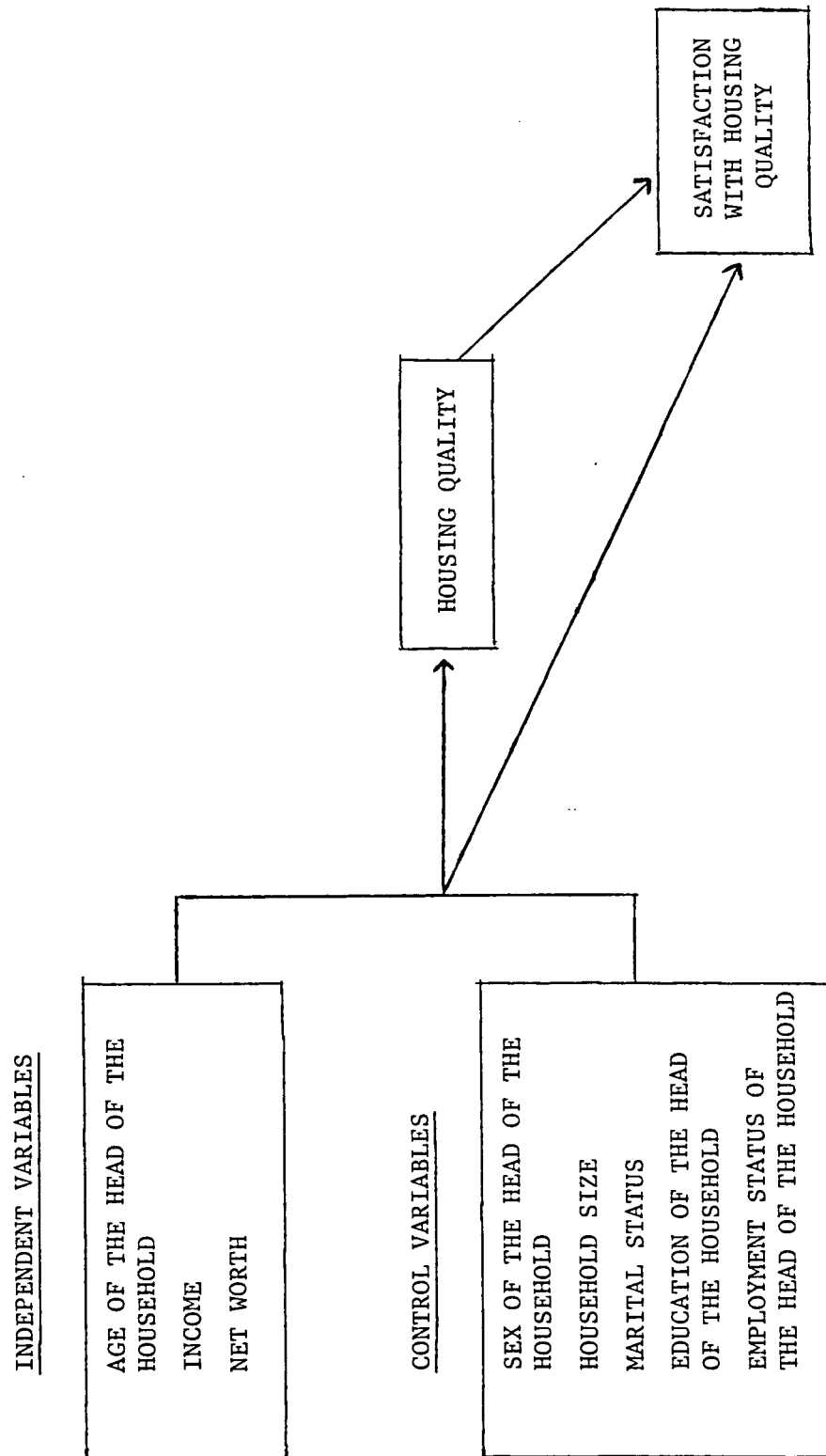


Figure 1. Theoretical causal model

CHAPTER II. PROCEDURES

The Sample

The data, "Income and Expenditure Assessment of Iowa Households," used for this analysis were acquired during the summer of 1976 by the Home Economics Research Institute and the Department of Family Environment with the assistance of the Statistical Laboratory at Iowa State University. The research entitled "Comprehensive Development of a Standard of Needs for Iowa ADC Recipients" was funded by the Iowa General Assembly and was designed to help provide information for families and other persons who are concerned about family budgets and annual expenditures. A probability sample was selected from the state of Iowa that yielded 664 completed interviews. Only the respondents that are homeowners with complete income data are used in this thesis. Four hundred forty-eight households met the criteria. According to Beutler (1978), the study was designed so that one-half of the interviews would be completed by primary households. Primary households were required to meet the following criteria: 1) "the head of the household had to be less than 65 years of age, 2) the household had to have at least one child under the age of 18, and 3) the total yearly income of all household members in 1975 had to be less than \$9,500" (p. 14). The remainder of family households and single-person households were categorized as secondary households. In

weighting the complete sample, Beutler (1978) stated that:

Interviews were to be obtained from all Primary households identified. Secondary households were numbered being carried over from segment to segment throughout an interviewer's assignment. An ongoing systematic sample of these households was selected for interviewing at a rate of 1 out of 8.5. Thus, a self-weighting sample of Secondary households was selected at a rate of 1 out of 1657.5. These rates included an allowance for anticipated nonresponse (refusals, inability to find people at home, etc.). Because of the length and subject matter of the questionnaire and the time of year (July) in which the interviewing took place, allowance was made for a 20 percent nonresponse rate—a somewhat greater allowance than usual [p. 16].

For this thesis, the original weighted sample was 664 cases. The resultant 448 unweighted cases representing the homeowners became 460 cases when weighted. The analysis is based on the weighted sample of homeowners.

The Variables

Treatment of missing data

Missing data were recoded either to the mean, median or mode if there were only two or three cases that were missing or initially coded incorrectly. Fortunately, no more than three cases were missing from the original data. The way in which the initial variables are coded and then recoded is explained later in this

thesis.

The independent variables

The main independent variables that were focused on in this study were age of the head of the household, the sum of all income within the household, and net worth. Other independent variables that serve as control variables include sex head of the household, household size, marital status, education of the head of the household and employment status of the head of the household.

Age Age is a continuous variable indicating the age in years of the head of the household. For the crosstabulation analysis, the age variable was coded so that respondents age 19 to 44 = 1 where 41 percent of the sample are classified as being young adults, respondents age 45 to 64 = 2 which represented 33 percent being classified as middle aged, and respondents age 65 to 87 = 3 where 26 percent of the sample are classified as being elderly. The mean age was 50.7, with a median of 50 and standard deviation of 17.5.

Income Income is defined as the total household income from all sources. Income ranges from \$1,008 to \$81,900. The income variable was coded as follows: Total household income that ranges from \$1,008 to \$9,499 = 1 where 34 percent are classified as low income, \$9,500 to \$16,599 = 2 where 33 percent are middle income,

and other households with a total of \$16,600 to \$81,900 = 3 where 33 percent of the sample are classified as high income. The mean value for income was 14,570.00 with a median of 12,960 and standard deviation of 9,920.2.

Net worth Net worth is assets minus liabilities. Assets are defined as dollar amounts in checking account, savings account, certificates of deposit, mutual funds, stocks, bonds, annuities, other financial assets, an estimate of the dollar amount the house would sell for on June 1, 1976, equity held in acreage or farmland, business, other real estate and recreational equipment plus the year, make and model of each vehicle owned and used for private transportation. Liabilities are defined by the amount owed on interest being charged on bank charge cards (Master Charge, Bank Americard, etc.), retail store credit cards and charge accounts, oil company credit cards or charge accounts, dollar amount of payments on recreational loans, hospital or medical expenses, vehicle(s) consolidated loans, home improvements or home furnishings loan(s), second mortgage loan(s) on home, educational loan(s) and other non-business loans excluding the home mortgage.

Net worth ranges from 0 to 933,100. The initial coding where three respondents indicated negative values for their net worth were coded to zero. Other codings were used for crosstabulation purposes. Respondents with 0 to 14,999 = 1 which represents 23 percent of the sample and are categorized as having low net worths,

15,000 to 31,999 = 2 which represents 26 percent of the sample and are categorized as having medium net worths, 32,000 to 66,999 = 3 which represents 25 percent of the sample and are categorized as having medium high net worths, and 67000 to 933,100 = 4 which represents 26 percent of the sample and are categorized as having high net worths. The mean value of net worth is 68,610 with a median of 32,000 and standard deviation of 113,225.

The control variables

Household size Household size is the number of persons living in the household as of June 1, 1976. The household size variable was coded so that households with 1 to 2 persons = 1 which yielded 44.8 percent of the sample, those with 3 to 4 persons = 2 which yielded 34.1 percent, and others with 5 to 11 = 3 which yielded 21.1 percent of the sample. The mean value for household size was 3.2 with a median of 3 and standard deviation of 0.71.

Marital status Marital status is used as a dichotomous variable that was originally coded from 1 to 5 ranging from never married to married. Marital status was coded so that respondents that are not currently married = 0 which represents 19 percent of the sample, and those that are married = 1 which represents 81 percent of the sample.

Sex Sex is a dichotomous variable defined as sex of the household head. Sex was coded where 0 = male and 1 = female. The sample indicates that 84.3 percent are men and 15.7 percent are women.

Education Education indicates the number of years of schooling completed by the head of the household. In the sample, 31.2 percent have from 0 to 11 years of schooling, 39.5 have 12 years of schooling, and 29.3 percent have 13 or more years of schooling. The mean value for education was 11.8 with a median of 12 and standard deviation of 3.

Employment status Employment status is a dichotomous variable that was originally coded from 1 to 6 ranging from retired to working full time. Employment status was recoded so that respondents that are unemployed = 0, and those that are employed = 1. In this sample, 33.2 percent are unemployed and 66.8 percent are employed. The mean value of employment status is 4.5 with a median of 6 and standard deviation of 2.13.

Housing quality

The intervening variable, housing quality is a scale based on a factor analysis of bedrooms, living or dining rooms, separate dining rooms, kitchens, family or rec rooms, dens or libraries,

other rooms, single car garage(s) or carport(s), whether or not respondents have a combination of storm windows and doors and the main source of heat. Storm windows and doors were combined to create a new item and coded where 0 indicates that the individual(s) has neither, 1 indicates that the individual(s) has one or the other and 2 indicates that the individual(s) has both. The main source of heat variable was coded such that respondents who have electric and central heat = 2, respondents that have space or other heat = 1 and other respondents that have neither = 0. Factor analysis was used to group the set of quality variables together using principal components extraction and varimax rotation to compute factor scores for a specific variable indicating quality. The factor analysis (Table 1) was implemented seeking three factors. The first factor appeared to be the quality factor whereas the factor loading of the numbers in Factor 1 was used for weighing (Nie, 1983). The second was a quantity factor due to heavy loading of the numbers and the number of rooms, or the correlation of the set of factor scores into a specific category. The third factor has very little of both quality and quantity context and explains only a small portion of the variance. The factor scores for the first factor were used to measure housing quality and coded where -4.4615399 through $-0.17135 = 1$, -0.1713499 through $0.58774 = 2$ and 0.59096 through $2.66364 = 3$ ranging from low to high quality. These factor scores were used for

Table 1. Factor analysis of housing quality (Varimax Rotation)

	Factor 1	Factor 2	Factor 3
Number of bedrooms	.11337	.75549	.06635
Number of living or single rooms	-.07081	-.04289	.07262
Number of separate dining rooms	-.02030	.77090	.01014
Number of kitchens	-.02001	.21946	-.13356
Number of family or recreation rooms	.58822	.09289	-.16480
Number of dens or libraries	.48200	-.13346	.30295
Number of other rooms	-.06643	.28828	.51533
Number of single car garages or carports	.04975	-.17457	.45736
Combination of storm windows and doors	.64497	.06279	.09458
Main source of heat	.65776	-.03774	-.12953

crosstabulation purposes. The mean value for this scale was 0 with a median of -0.101 and standard deviation of 1.

Satisfaction with housing quality

Housing satisfaction is the dependent variable for this study. The question, how satisfied or dissatisfied are you with the quality of your housing was originally coded from 1 to 4 ranging from very dissatisfied to very satisfied.

Housing satisfaction was coded as follows for crosstabulation purposes: 1 = respondents who are dissatisfied with their housing, 2 = respondents who are somewhat satisfied with their housing and 3 = respondents that are satisfied with their housing. The mean value for this scale was 3.1, with a median of 3 and standard deviation of .471.

The Analysis

Regression analysis is used to implement the purpose of this thesis along with other preliminary steps including frequency distribution, crosstabulations, and Pearson correlation. The data were analyzed using the Statistical Package for Social Sciences (Nie, 1983). The main analysis includes two multiple regression equations, which are used to test a model based on several hypotheses about the variables within the model. Multiple

regression is a general statistical procedure used to "study the relationship between a dependent variable and a set of independent variables" (Nie, 1983, p.15). Regression also provides a number of statistics to evaluate how well the model fits and the contributions of individual variables (Nie, 1983).

In Table 2, the preliminary crosstabulation analysis of variables used indicates the strength of the relationship between various variables producing chi-square and gamma. The significance level for chi-square is .05 and less. The criterion level for the gamma is .15 and above.

In Table 2, the most significant variables are presented followed by a brief discussion of all other variables. Housing quality is positively correlated with housing satisfaction. Age of the head of the household is negatively correlated with housing satisfaction and housing quality. Income is positively correlated with housing satisfaction and housing quality. Net worth is positively associated with housing satisfaction and housing quality. Other variables such as household size, marital status, education of the head of the household, and employment status are significantly and positively correlated with housing quality, but sex of the head is negatively correlated with housing quality.

Table 3 indicates the number of cases, the level of significance, and the correlation number for each variable specified. The linear relationships among the pairs of variables

Table 2. Chi-square significance levels and gamma generated from crosstabulation

Dependent by Independent Variable	Chi-square Significance	Gamma
<u>Satisfaction with housing quality by</u>		
Housing quality	.001*	.33**
Age of the head of the household	.001*	-.27**
Income	.001*	.31**
Net worth	.119	.18**
Sex of the head of the household	.750	-.10
Household size	.000*	.28**
Marital status	.370	.17**
Education of the head of the household	.007*	.20**
Employment status	.434	.14
<u>Housing quality by</u>		
Age of the head of the household	.000*	-.37**
Income	.000*	.53**
Net worth	.000*	.23**
Sex of the head of the household	.000*	-.56**
Household size	.000*	.36**
Marital status	.000*	.50**
Education of the head of the household	.000*	.44**
Employment status	.000*	.40**

* Chi-square level of significance < .05.

**Criterion level of significance \geq .05.

Table 3. Pearson product-moment correlation matrix

Variables	1	2	3	4	5	6
1. Employment status	--	30*	18*	40*	-29*	01
2. Education of head		--	-04	14*	-02	06
3. Marital status			--	29*	-67*	-03
4. Household size				--	-34*	-06
5. Sex of head					--	-08
6. Net worth						--
7. Income						
8. Age of head						
9. Housing quality						
10. Satisfaction with housing quality						

*P \leq .05.

7	8	9	10
36*	-62*	21*	06
30*	-35*	33*	09*
21*	-10*	15*	05
26*	-50*	15*	12*
-25*	24*	-20*	03
33*	29*	21*	11*
--	-24*	35*	10*
	--	-17*	-13*
		--	24*
			--

are illustrated in the Pearson product-moment correlation matrix. This matrix is formulated using control, independent, intervening and dependent variables. Therefore, the only relationships that will be discussed in the analysis and findings section are the significant ones at the .05 level and below.

Regression Analysis

In the regression analysis, two multiple linear regressions are examined:

1. $HSAT = f (HQUAL, AGEHED, INC, NW, \& CONT)$
2. $HQUAL = f (AGEHED, INC, NW, \& CONT)$

where HSAT is the index of housing satisfaction

HQUAL is the index of housing quality

AGEHED is the age of the head of the household

INC is the total household income within the household

NW is the household net worth

CONT is the set of control variables

(household size, marital status, sexhead of household, education of the head of the household, and employment status of the head of the household).

CHAPTER III. ANALYSIS AND FINDINGS

In this chapter, the results of the data analysis will be introduced. A discussion of the Pearson product-moment correlation matrix will be presented followed by a discussion of the two multiple regression equations. The first equation indicates the effects of housing quality, age, income, net worth, and the control variables on satisfaction with housing quality. The second equation includes the effects of age, income, net worth, and the control variables on housing quality. The significant findings at or below the .05 level are indicated by an asterisk within tables three through seven. In general, only the significant results will be discussed.

Correlation Analysis

The following relationships shown in Table 3 are discussed:

1) the control variable(s), 2) the independent variable(s), 3) the control and independent variable(s), 4) the control and dependent variable(s), and 5) the independent and dependent variable(s).

The control variable(s)

In Table 3, it was expected that all of the control variables would be intercorrelated with one another. However, it was interesting to find that all are not significantly related. The

stronger relationships that will be discussed are at least (.23) or greater. Employment status is positively correlated with education (.30) and household size (.40), but negatively correlated with sex of the head (-.29). Marital status is positively associated with household size (.29) but negatively associated with sex of the head (-.67). Household size is negatively related to sex of the head (-.34). None of these correlations is surprising and none is so large as to induce concern for multicollinearity. A condition of high or near perfect correlation among the independent variables in the multiple regression equations are indicated.

The independent variable(s)

In the Pearson product-moment correlation matrix, (Table 3) all of the independent variables are significantly intercorrelated. Net worth is positively related to income (.33) and age of the head (.29). Income is negatively correlated with age of the head of the household (-.24).

The control and the independent variable(s)

As anticipated, all of the control variables are significantly correlated with the independent variables except net worth. All of the control variables are positively related to

household income except sex of the head of the household. The control variables in Table 3 are negatively correlated with age of the head of the household except sex of the head of the household. Employment status is positively correlated with income (.36) but negatively correlated with age of the head of the household (-.62). Education of the head of the household is positively related to income (.30) but negatively related to age of the head of the household (-.35). Marital status is positively associated with income (.21) but negatively associated with age of the head of the household (-.10). Household size is positively correlated with income (.26) but negatively correlated with age of the head of the household (-.50). Lastly, sex of the head of the household is negatively related to income (-.25) but positively related to age of the head of the household (.24).

The control and the dependent variable(s)

Even though the correlation between these pairs of variables are of little direct concern in this thesis, very few of the control variables are correlated with the dependent variable (satisfaction with housing quality). Satisfaction with housing quality is positively related to education of the head of the household (.09), and household size (.12).

The independent and the dependent variable(s)

Under this section, it was expected that all of the independent variables would be significantly related to housing satisfaction. Satisfaction with housing quality is positively and significantly correlated with net worth (.11) and income (.10) but negatively correlated with age of the head of the household (-.13) yet significant.

Regression Analysis

In this section, two multiple regression equations are presented. A reduced model of each of the multiple regressions using only the variables that were significant from the full model was performed.

Equation I

The first equation, (Table 4) $HSAT = f(HQUAL, AGEHED, INC, NW, AND CONT)$ indicates a low but statistically significant relationship of the variables in the equation. The R^2 , or proportion of variance for the full model of the regression equation is .078 with an F-Ratio of 4.238. The reduced model of multiple regression for the first equation (Table 5) yielded an R^2 of .064 with an F-Ratio of 15.744.

Table 4. Full regression analysis model of satisfaction with housing quality on housing quality, age, income, net worth, and the control variables

Variables	B	Beta	T
Housing quality	.109	.231	4.556*
Age of head	-4.353	-.161	-2.292*
Household income	-6.514	-.014	-.222
Household net worth	2.161	.052	.924
Household size	.020	.073	1.314
Marital status	.030	.060	.946
Sex of head	.123	.096	1.488
Education of head	-3.316	-.021	-.401
Employment status	-.021	-.096	-1.450
Constant	= 3.271		
R ²	= .078		
R ² Adjusted	= .060		
F-Ratio	= 4.238		

*P \leq .05.

Table 5. Reduced regression analysis model of satisfaction with housing quality on age and housing quality

Variables	B	Beta	T
Age of head	-2.560	-.095	-2.067*
Housing quality	.104	.220	4.798*
Constant = 3.274			
R ² = .064			
R ² Adjusted = .060			
F-Ratio = 15.744			

*p \leq .05.

In the regression analysis of satisfaction with housing quality on housing quality, age, income, net worth, and the control variables (household size, marital status, sex of the head of the household, education of the head of the household, and employment status), housing quality and age of the head of the household were found to be significant predictors of satisfaction with housing quality. Housing quality indicates a positive relationship on satisfaction with housing quality (.231). As predicted, housing quality is strongly associated with satisfaction with housing quality because many people value quality which in turn leads them to be more satisfied with their housing when it is present. Satisfaction with housing quality is negatively correlated with age of the head of the household (-.161). This was the most surprising because it seems that the older one becomes, the more satisfied they would be with the quality of their housing. Variables such as household net worth, household size, marital status, and sex of the head of the household are positively related to satisfaction with housing quality but not strongly related to satisfaction with housing quality. Other variables like household income, education of the head of the household, and employment status are negatively related to satisfaction with housing quality.

Table 5 presents the reduced model of the multiple regression, satisfaction with housing quality on age of the head

of the household and housing quality. Age of the head of the household has a negative effect on satisfaction with housing quality (-.095). Housing quality has a positive effect on satisfaction with housing quality (.220).

Equation II

The second equation, (Table 6) $HQUAL = f(\text{AGEHED, INC, NW, AND CONT})$ indicates a statistically significant relationship of the variables in this equation. The R^2 , or proportion of variance for the full model of the second equation is .202 with an F-Ratio of 14.239. The reduced model of this equation, (Table 7) yielded an R^2 of .200 with an F-Ratio of 38.116.

In the regression analysis of housing quality on age, income, net worth, and the control variables (household size, marital status, sex of the head, education of the head, and employment status), the second multiple regression equation household income, sex of the head of the household, and education of the head of the household were found to be the best predictors of housing quality among all of the variables used. Household income indicates a positive relationship with housing quality (.227). If an individual is accustomed to or desires "good" quality then it would be necessary for them to have some source of income flowing into the household so that they can invest in specific quality items that they desire. Sex of the head of the household has a

Table 6. Full regression analysis model of housing quality on age, income, net worth, and the control variables

Variables	B	Beta	T
Age of head	8.663	.015	.231
Household income	2.288	.227	4.020*
Household net worth	2.367	.027	.512
Household size	5.786	9.905	.193
Marital status	.028	.027	.457
Sex of head	-.329	-.120	-2.015*
Education of head	.090	.268	5.730*
Employment status	5.183	1.106	.018
Constant	= -1.562		
R ²	= .202		
R ² Adjusted	= .187		
F-Ratio	= 14.239		

*P \leq .05.

Table 7. Reduced regression analysis model of housing quality on education, sex of the head, and income

Variables	B	Beta	T
Education of head	.087	.259	5.905*
Sex of head	-.374	-.136	-3.147*
Household income	2.451	.243	5.357*
	Constant	=	-1.331
	R ²	=	.200
	R ² Adjusted	=	.195
	F-Ratio	=	38.116

*p < .05.

negative and significant effect on housing quality ($-.120$) which could be explained by the low incomes of households headed by females. Education of the head of the household indicates a positive relationship with housing quality ($.268$). Individuals acquainted with quality as a result of educational experiences have developed a concept of quality and are therefore able to define and recognize it within their own conceptual framework. All other variables such as age of the head of the household, household net worth, household size, marital status, and employment status are positively related to housing quality but not strongly significant.

Table 7 indicates the results of the reduced model of multiple regression of four variables, education of the head of the household, sex of the head of the household, and household income on housing quality. Education of the head of the household has a positive effect on housing quality ($.259$). Sex of the head of the household has a negative effect on housing quality ($-.136$). Household income also has a positive effect on housing quality ($.243$).

Results from the tested model

In conclusion, an analysis of the reduced model using the variables that were significant at or below the $.05$ level from the two equations will be presented. The purpose of this reduced

model is to clarify and simplify the results in Figure 2.

Age of the head of the household has a negative direct effect on satisfaction with housing quality. Housing quality has a positive direct effect on satisfaction with housing quality meaning persons with high quality homes are more satisfied with their housing than those with low quality homes. If individuals have what they perceive as quality housing then they are more likely to be satisfied with their dwelling.

Household income has a positive direct effect on housing quality which in turn yields an indirect effect on satisfaction with housing quality when introducing the control variables. The analysis also indicated that education had the same effects on housing quality and satisfaction with housing quality but at different significance levels. Sex of the head of the household has a negative but direct effect on housing quality which in turn has some influence on satisfaction with housing quality. Results from the regression analysis indicate that households headed by females have lower quality housing compared to households headed by males which in turn cause female heads to be less satisfied with the quality of their homes than males. Lastly, variables such as income, sex of the head of the household, education of the head of the household, housing quality, and satisfaction with housing quality fit the model proposed earlier within this thesis which must mean that these variables are intercorrelated.

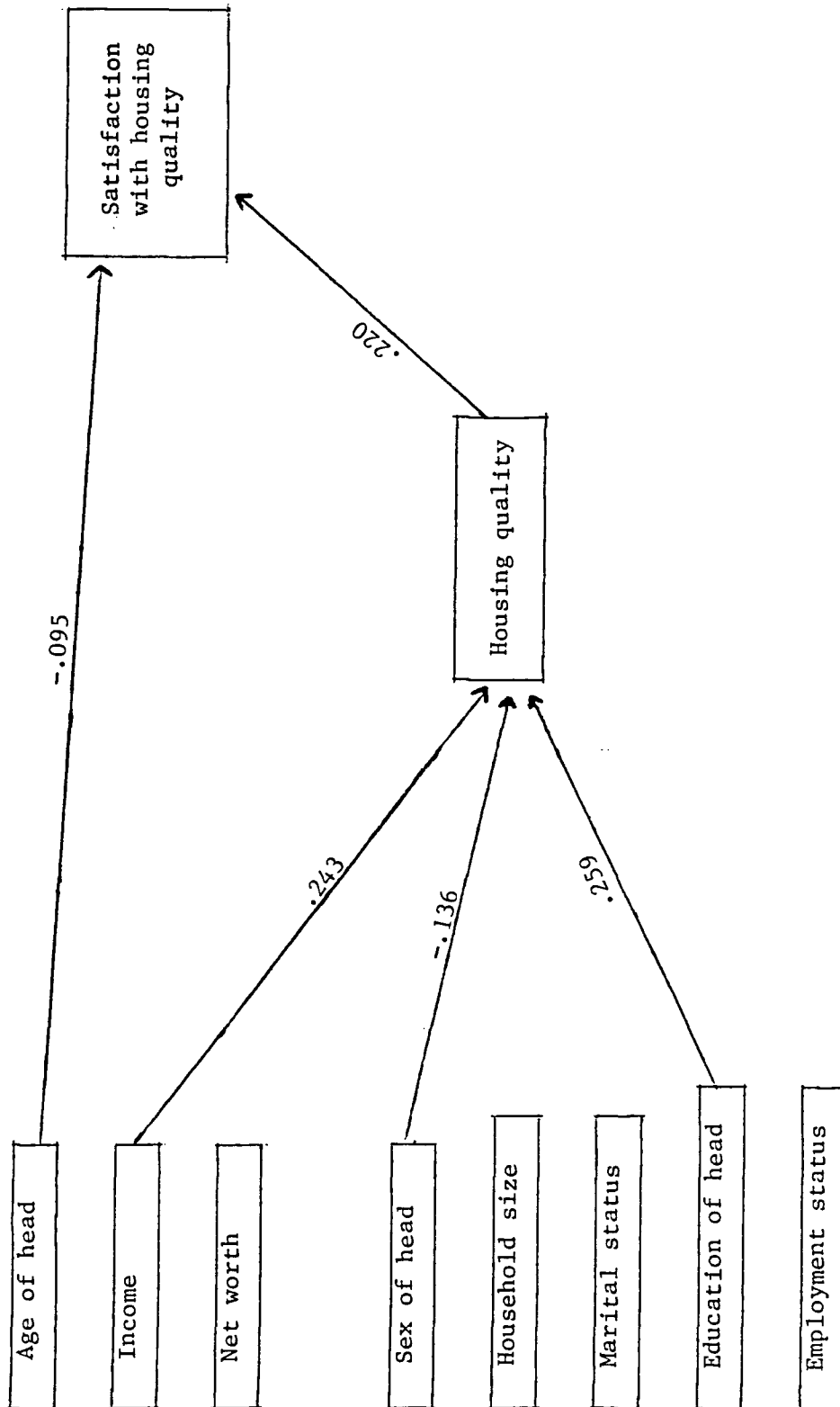


Figure 2. Diagram of tested causal model

CHAPTER IV. CONCLUSIONS

Purpose

The main purpose of this thesis is to analyze the relationship between housing quality and satisfaction with housing quality of homeowners in the context of variations in age, income, net worth. The theoretical hypotheses tested indicate that age, income, and net worth affects housing quality which in turn affects the level of satisfaction with housing quality. An additional number of independent variables that served as control variables are presented in this study to help explain housing quality and satisfaction with housing quality.

Satisfaction with Housing Quality

In this section, a number of predictors used in this thesis are significantly associated with satisfaction with housing quality. It was hypothesized that age of the head of the household, income, and net worth would be positively related to satisfaction with housing quality. It was also predicted that sex of the head of the household, household size, marital status, education of the head of the household, and employment status would be positively correlated with satisfaction with housing quality.

The results from the regression analysis indicate that older heads of the household have lower levels of satisfaction with

housing quality than younger heads of the household. This represents a perfect example of spuriousness. Findings show that this negative relationship between age of the head and satisfaction with housing quality is definitely explained by other factors such as income, sex of the head, and education. It should also be noted that the satisfaction with housing quality variable used in this study is different from the housing satisfaction variable in the literature because it includes an overall level of satisfaction with housing. Findings also indicate that the amount of income, the level of education, and sex of the head of the household determines how satisfied or dissatisfied one is with the quality of their housing. All other predictors such as net worth, household size, and employment status contribute very little to the explanation of satisfaction with housing quality.

Housing Quality and Satisfaction with Housing Quality

The findings indicate that housing quality definitely affects consumers' levels of satisfaction with housing quality in a positive and direct way which is supported by the literature. The higher the quality of a persons' housing, the more satisfied they are likely to be with the quality of their housing.

Housing Quality

Several significant variables served as indicators of housing quality. The significant indicators include age of the head, income, net worth, sex of the head, household size, marital status, education of the head, and employment status. In the regression analysis, income, sex of the head, and education of the head serve as significant explanatory predictors of housing quality. The amount of income can predict the kind of housing an individual will choose whether it be high, medium, or low quality housing. As a persons' level of education increases so does their achieved quality of housing. Findings also indicate that male-headed households are more likely to have high quality housing relative to female-headed households because of the income males make relative to females. Of course, this could also mean that males and females have different preferences or tastes in what they view as quality housing. All other predictors such as age of the head, net worth, household size, marital status, and employment status are weak predictors which do not add very much to the explanation of housing quality.

Implications

Since homeowners are used in this study, the implications of the findings are cause for concern. The results from the regression analysis indicate that if divorce rates are decreased, or if the national issue of comparable worth is addressed and dealt with, then this could improve consumers' levels of housing quality and satisfaction with housing quality. Also, as a persons' level of education increases then it is more likely their quality of housing and their level of satisfaction with housing quality would increase because of their preferences or perception of housing quality which comes from understanding the quality of housing.

A suggestion for further research indicates that additional measures of housing quality are needed. The strong measures in this study are the number of family or recreation rooms, number of dens or libraries, storm windows and doors, and main source of heat. However, other measures such as an air conditioning unit, the value of a house, floor coverings, and so forth could be incorporated within a measurement of housing quality which would strengthened the relationship among variables used.

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