

*HOUSING STATUS, HOUSING EXPENDITURES, AND SATISFACTION
WITH HOUSING QUALITY*

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ABSTRACT

This paper is an investigation of the relationship between monthly housing expenditures and satisfaction with quality of housing among renters, owners with mortgages, and owners with no mortgages. The sample includes 592 Iowa husband-and-wife families in the age range from 18 to 60. The data are from a systematic random sample collected from 13 small cities during 1975 and 1976. The analyses include correlation and regression.

Housing expenditures are positively related to family size, income, and education. The monthly housing expenditures for the renter with average characteristics is \$159.91; for the owner with no mortgage, \$95.42; for owners with a mortgage, \$206.59. Satisfaction with housing quality is positively related to family size, age, education and housing expenditures. Renters are less satisfied with housing quality than are either owners with a mortgage or owners with a paid-off mortgage. However, for renters, the satisfaction increases as a function of expenditures at a faster rate than it does for owners with and without mortgages.

INTRODUCTION

The purpose of this paper is to investigate the relationship between monthly housing expenditures and satisfaction with quality of housing among renters, owners with a mortgage and owners with no mortgage. The analysis includes husband-and-wife families in the age range from 18 to 60.

Housing Status

For the purposes of this paper, housing status is defined as a three-way classification: 1) renters, 2) owners paying a mortgage, and 3) owners with no mortgage to pay. In 1981, 65.3 percent of

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the U.S. population owned their homes. Approximately 64.5 percent of those home owners had mortgages in that same year (USBC, 1984).

There is a strong "life cycle effect" in housing status. Young families typically rent. As they become older, especially when the first child is born, they are likely to buy a house, which increases their housing expenditures. As these same families near retirement, some are able to pay off the mortgage, thereby reducing housing expenditures (Fein and Lane, 1981; Morgan, 1965; Roistacher, 1974; Treadway, 1980; Winter, 1980).

Housing Expenditures

An economically sound estimate of the annual or monthly cost of a home can be derived by summing the estimates of the individual components of cost (Duncan and Morgan, 1980). The cost of a family's housing reflects the total quantity and quality of that family's housing (Roistacher, 1974). For many purposes, it is the "out of pocket" expenditures that are of primary concern. Families seek housing quality congruent with their actual or expected social status while also seeking expenditures congruent with their economic resources (Morris and Winter, 1978).

Housing status is a strong predictor of housing costs. The largest difference in percent of income spent on housing is between owners and renters (Crull, 1976; Meeks, 1984). Owner's cash outlays for housing vary for a number of reasons including household characteristics, location and mortgage status. However, a great deal of variance remains even when all these factors are taken into account (Fein and Lane, 1981).

The single best predictor of the amount spent on housing is family income (Fein and Lane, 1981; Meeks, 1984; Morris and Winter, 1978; Roistacher, 1974). The relationship holds whether the family is an owner or renter. As income increases, the amount of money spent on housing also increases, but at a decreasing rate. According to Morris and Winter (1978) and Roistacher (1974), housing expenditures are relatively inelastic.

Education of the head is also a strong predictor of housing expenditures (Morgan, 1965; Roistacher, 1974). However, when differences in family income and education of the head are controlled, family size is the most important determinant of housing expenses for both owners and renters (Limmer, 1980; Roistacher, 1974).

Age is another predictor of housing costs, particularly for owners. Housing expenses rise until the head is in the late 40's or early 50's. Then the expenses begin to fall (Fein and Lane, 1981; Roistacher, 1974; Winter, 1980). The relationship between the family life cycle and housing expenses is relatively strong and curvilinear.

Housing Quality Satisfaction

Satisfaction with housing quality is defined as a subjective evaluation of the degree to which housing quality needs are met. It is possible to be dissatisfied with specific features, yet generally satisfied with the whole (Brink and Johnston, 1979; Morris and

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Winter, 1978; Schnittgrund, 1982). Harris (1976) notes a much higher correlation between quality and satisfaction with housing quality than between quality and overall housing satisfaction.

Renters and owners do not have similar levels of satisfaction with housing characteristics. Renters are less satisfied than are owners (Lane and Kinsey, 1980). They note that people are more likely to be satisfied in more expensive homes. There is evidence that a ceiling effect is possible within the housing quality variable. As families reach high levels of housing quality, they derive little additional satisfaction from further increases in housing quality (Harris, 1976).

HYPOTHESES

The hypotheses tested in this paper are:

1. Owners with a paid-off mortgage have the lowest monthly housing expenses, followed by renters, followed by owners with a mortgage.
2. Renters have the lowest satisfaction with housing quality, followed by owners with mortgages, followed by owners with paid-off mortgages.
3. There is a positive relationship between monthly housing expenses and satisfaction with housing quality.

The data are from a stratified random sample of 592 husband-and-wife households living in incorporated communities in a six-county area in northwestern Iowa. All communities in the area with populations of 2,000 or more are included. Seven communities were randomly selected from those with populations under 2,000. Trained interviewers administered an interview schedule to the household head or the spouse of the head during 1975 and 1976.

THE VARIABLES

Operationally, satisfaction with quality of housing is the sum of the degree of satisfaction with the following housing attributes: 1) floor plan, 2) physical condition of the house, 3) comfort of the home, 4) style and design of the home, and 5) image of the home. Each of these satisfaction items is measured on a four-point scale from very dissatisfied to very satisfied. The range of the satisfaction with quality scale is 5 to 20, and the mean is 15.48. The alpha reliability of the scale is .82.

The mean of monthly housing expenditures is \$167.99. Housing expenses are monthly cash outlays for rent, mortgage, utilities, and property taxes. The mean value of monthly housing expenses for renters is \$150.32; for owners with the mortgage paid off, \$90.13; and for owners with a mortgage, \$208.21.

Housing status is divided into three categories: renters, owners with a mortgage paid off, and owners with a mortgage. About 18

percent of the sample (N=109) are renters. Of the 82 percent (N=483) of the sample who are owners, 146 are owners with the mortgage paid off and 337 have a mortgage.

The demographic variables are total household income, education of the head of household, age of the head of household and household size. Total household income is the sum of income from all sources for all household members. The mean total household income for the sample is \$15,581. The mean value of age of head of household is 39. Household size on average is 3.7. Education of the head of household has a mean value of 12.5.

ANALYSIS

There are two sets of regression analyses with a number of steps in each set. The first set has monthly housing expenses as the dependent variable. The first step of the first set includes only the demographic variables. The second step includes the housing-status dummy variables.

The second set of regressions has satisfaction with housing quality as the dependent variable. The first step of the second set includes the regression of satisfaction on monthly housing expenses and the demographic characteristics. The second step includes housing status. The third step adds housing status slope dummies. The slope dummies are computed by multiplying the housing status by monthly housing expenses (Fox, 1981).

Because earlier analyses indicate a curvilinear relationship between age and monthly housing expenditures, several tests were performed taking this relationship into account. Only the significant results are discussed in this section. Age squared and the interaction between housing status and age are included in the first set of regressions. The interaction terms are not significant; age squared is significant. In the second set of regression analyses, the curvilinearity of age is tested through the use of dummy variables and by squaring age. Age is found to have a linear effect. The interaction between age and monthly housing expenses was tested and is not significant.

Correlation Matrix

The correlation matrix (Table 1) includes the dependent and independent variables in the model. Only the significant correlations are discussed here. Renters tend to have low monthly housing expenses and low satisfaction with housing quality. Families with young heads of household and small households tend to rent.

Families with paid-off mortgages tend to have low housing expenses. Owning, but having no mortgage, is accompanied by high total household incomes and high satisfaction with housing quality. Such owners are older than renters or owners with mortgages. They have less education and smaller families than do renters and mortgage holders.

Owners with a mortgage tend to have higher housing expenses than either of the other two groups. Both their satisfaction with

Table 1. Pearson Product Moment Correlation Matrix of Independent and Dependent Variables

	1	2	3	4	5	6	7	8	9
1.Renter	--								
2.Owner-No Mortgage	-.28*	--							
3.Owner with Mortgage	-.53*	-.66*	--						
4.Monthly Housing Expenses	-.10*	-.60*	.61*	--					
5.Quality Satisfaction	-.26*	.05	.17*	.22*	--				
6.Total Household Income	-.07	.03	.02	.17*	.12*	--			
7.Age of the Head of Household	-.31*	.40*	-.12*	-.16*	.17*	.11*	--		
8.Education of the Head of Household	.05	-.15*	.10*	.31*	.16*	.16*	-.25*	--	
9.Household Size	-.09*	-.15*	.20*	.22*	-.06	.06	-.07	.09*	--

* $p < .05$

housing quality and their incomes tend to be higher. Young and large households are more likely to have a mortgage than are the middle-aged and smaller households. Heads of household with high education are more likely to have a mortgage than are those with lower levels of education.

The higher the housing expenses, the higher is the satisfaction with housing quality. Families with high monthly housing expenses tend to be those with higher incomes, higher education and larger families. In preliminary analyses, a curvilinear relationship is found between housing expenses and age. On the average, the older household heads have the lower housing expenses. The youngest age group has a moderate amount of housing expenses. Middle-age levels have the highest monthly expenses. High satisfaction with housing quality is related to high incomes, young heads of household, high education and small household sizes.

Regression of Monthly Housing Expenditures

The regression equation with monthly housing expenditures as the dependent variable is a two-step regression (Table 2). The first step is the regression analysis of housing expenses on the demographic characteristics including age of the head squared. The second step adds housing status. The F-ratio for the entire model

Table 2. Regression Analysis of Monthly Housing Expenses on Socio-demographic Characteristics and Housing Status

				Step 1		
	b	beta	t score			
Total Household Income	.001	.108	2.81***			
Age of the Household Head	11.115	1.756	5.05***			
Education of the Household Head	7.195	.239	6.07***			
Household Size	2.494	.051	1.16			
Age of the Household Head Squared	-.147	-1.862	-5.31***			
Constant	-132.245					
R ²	.1905					
df	5 & 586					
F-Ratio	27.59***					
				Step 2		
	b	beta	t score			
Total Household Income	.001	.103	3.45***			
Age of the Household Head	4.851	.766	2.75**			
Education of the Household Head	6.456	.214	7.00***			
Household Size	1.291	.026	.772			
Renter	-46.679	-.241	-7.55***			
Owner - No Mortgage	-111.173	-.638	-19.29***			
Age of the Household Head Squared	-.055	-.692	-2.46**			
Constant	8.376					
R ²	.5115					
df	7 & 584					
F-Ratio	87.35***					

***p<.001

**p<.01

*p<.05

and the t-score for each of the demographic variables, except household size, are significant in the first step of the regression analysis. Approximately 19 percent of the variance in monthly housing expenditures is explained by total household income, age of the head of household, age squared and education of the head of household.

Each of the coefficients is positive except for age of the head of household squared. Having a positive coefficient for age of the head of household and a negative coefficient for age squared indicates a curvilinear relationship between monthly housing expenses and age.

When housing status is added to the regression analysis of housing expenses, the R^2 is 51 percent. Because the difference in the explained variance between the two steps of this regression analysis is significant, housing status adds significantly to housing expenses above and beyond the effect of the demographic variables. The overall F-ratio and the t-scores for each of the demographic variables, except household size, remain significant. Both the dummy housing status variables are significant as well. The curvilinear relationship between monthly housing expenditures and age still exists after adding housing status to the regression analysis. Owners with a mortgage have the highest monthly housing expenses. Renters have lower housing expenses than do owners with a mortgage, and owners with a paid-off mortgage have the least monthly housing expenses of all. Thus, hypothesis 1 is not rejected.

There is a body of literature that suggests tenure decisions and housing expenditure decisions are made jointly (King, 1980; Lee and Trost, 1978; Rosen, 1979). Therefore, the analysis given in Table 2 might be done through a two-stage least squares procedure to deal with the potential mutual causation. The main focus of this paper, however, is the separate contributions of these variables to housing satisfaction. The joint nature of the effects of these variables is reflected in the interaction terms incorporated in the analysis shown in Table 3.

When the average for each of the variables and the dummy coding scheme are put into the final estimating equation, a value is obtained for the monthly housing expenses for the renter, owner with a paid-off mortgage and owner with a mortgage, who have average characteristics. This does not mean the average renter or the average owner, but the average of the whole sample. The monthly housing expenses for the renter with average characteristics in the sample is \$159.91; for the owner with no mortgage, \$95.42; for owners with a mortgage, \$206.59.

Regression of Housing Quality Satisfaction

The regression analysis of satisfaction with housing quality is done in three steps (Table 3). Only the significant variables are included in the tables. The first step is the regression of satisfaction with housing quality on the demographic variables and monthly housing expenses. In the second step, the housing status dummy variables are added, and in the third step, the housing status slope dummies are entered.

In the first step, the demographic variables and housing expenditures explain approximately 12 percent of the variance in satisfaction with housing quality. The F-ratio for the total model is significant, and the t-score for each variable is significant.

Table 3. Regression Analysis of Satisfaction with Housing Quality on Monthly Housing Expenses, Socio-demographic Characteristics, Housing Status, and Housing Status Slope Dummies

	Step 1		
	b	beta	t-score
Age of the Head of Household	.044	.230	5.74***
Education of the Head of Household	.129	.144	3.46***
Household Size	-.148	-.101	-2.55**
Monthly Housing Expenses	.007	.229	5.48***
Constant	11.55		
R ²	.1175		
df	4 & 587		
F-Ratio	19.53***		

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

Table 3. Continued

	Step 2		
	b	beta	t-score
Age of the Head of Household	.031	.163	3.92***
Education of the Head of Household	.132	.147	3.58***
Household Size	-.177	-.121	-3.10**
Monthly Housing Expenses	.006	.201	4.85***
Renter	-1.151	-.199	-4.87***
Constant	12.48		
R ²	.1518		
df	5 & 586		
F-Ratio	20.97***		

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

Table 3. Continued

	Step 3		
	b	beta	t-score
Age of the Head of Household	.029	.151	3.62***
Education of the Head of Household	.135	.150	3.67***
Household Size	-.190	-.131	-3.33***
Monthly Housing Expenses	.005	.174	4.08***
Renter	-2.921	-.504	-3.89***
Renter Slope Dummy	.011	.314	2.48**
Constant	12.73		
R ²	.1606		
df	6 & 585		
F-Ratio	18.66***		

***p<.001

**p<.01

*p<.05

Larger families, families with an older head of household, and families with a household head who has more education tend to have higher monthly housing expenses. The higher the housing expenses, the higher is the satisfaction with housing quality. Thus, hypothesis 3 is not rejected.

In the second step of the regression analysis, the same demographic variables and monthly housing expenses have significant t-scores. The R² is 15 percent. Renters are less satisfied with housing quality than are owners with a mortgage. The difference is significant. The difference in satisfaction with housing quality between owners with a paid-off mortgage and those with a mortgage is not significant. As a result of this analysis, hypothesis 2 is rejected because the comparisons between the two categories of owners is not significant.

The R² in the model with the slope dummies included is 16 percent. The F-ratio for that model is significant. The t-scores for monthly housing expenses, household size, age, and education of the head of household are all significant. Renters continue to be less satisfied with housing quality than are owners with a mortgage. There is no significant difference in satisfaction with housing quality for owners with no mortgage as compared with owners with a mortgage.

The coefficient for housing expenditures is the slope for the reference variable (owners with a mortgage). The coefficient of each of the slope dummy variables for housing status indicates the difference in slope from the reference variable slope. In this case, the slope of owners with a mortgage is .005. The slope for renters

is .016. The difference between the slopes for owners with a mortgage and owners with a paid-off mortgage is not significant. The slope for renters is more positive than that for owners with a mortgage. That difference in slopes is significant, which indicates that, for renters, satisfaction increases as a function of expenditures at a faster rate than it does for owners with and without mortgages.

By substituting the mean score of each of the variables and the dummy coding scheme into the final estimating equation, it is possible to obtain the predicted satisfaction with housing quality score in the sample for the renter, owner with a paid-off mortgage, and owner with a mortgage, who have average characteristics. Owners with a mortgage have a satisfaction with housing quality score of 15.45. Owners with a paid-off mortgage have a house quality score of 15.92, while renters have a score of 14.41. There is a significant difference in the score between renters and owners with a mortgage, but not between owners with a paid-off mortgage and owners with a mortgage.

CONCLUSIONS

Owners with their mortgages paid-off have the lowest housing expenditures. Renters follow with the next highest amount of housing expenses. Owners with mortgages have the highest housing expenditures. The higher the monthly housing expenditures, the higher is the satisfaction with housing quality.

Renters are less satisfied with housing quality than are either owners with a mortgage or owners with a paid-off mortgage. Most American households prefer to own. That affects their satisfaction with housing quality. Once they own, satisfaction evidently is not affected by the amount spent. However, for renters, satisfaction with housing quality increases with expenditures. Renters, seemingly, are able to obtain additional satisfaction through additional expenditures. The satisfaction of owners may be derived primarily from the ownership itself rather than from presumed increments in quality that may accrue from higher expenditures.

The findings of this study indicate a curvilinear relationship between housing expenditures and age in the regression analysis where housing expenditures is the dependent variable. However, when satisfaction with housing quality is the dependent variable, age is found to be linear. Future study of this relationship would add to the knowledge about housing expenditures as families progress through the life cycle. Investigating this relationship with longitudinal data would be an asset to understanding the linkages between housing status, housing expenditures and satisfaction with housing quality.

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