

## **HOME MAINTENANCE BEHAVIOR AND THE ELDERLY**

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### Abstract

The results of a survey of 722 Wisconsin home owners are used to examine if older home owners maintain their homes as well as their younger peers. Possible reasons for the apparent age-related differences in home maintenance behavior are explored.

A model is proposed to identify and organize variables that may influence the initiation of home maintenance work. Results indicate that older owners report less home maintenance. Differences are more pronounced for energy-related improvements than for general improvements. Specific differences in maintenance behavior between older and younger home owners include: desire for improvements, length of residence, level of education, and expected duration of continued residence.

### Introduction

The vast majority (70 percent) of older Americans own their homes (U.S. Senate, 1984). In some rural communities older home owners account for up to one-fourth of all home owners (Wood, 1984). It has been common to assert that older home owners neglect or defer necessary home repairs and maintenance more often than do younger owners (Devine and Struyk, 1980; Thee, 1985).

Decreased home maintenance may have serious implications for the quality of life for older households:

1. Maintenance can correct health and safety hazards. The risk of home injuries is four times greater for persons 66 and over than for the population as a whole. Many of these injuries can be prevented by simple changes in features such as stairways and bathrooms (ASTM, 1986).
2. Energy conservation improvements can result in a reduction of household operating expenses and have indirect health benefits.
3. Maintenance can protect the value of the home. If maintenance is deferred there is a risk of substantially eroding the value of this asset.
4. Minor modifications to the home can often allow it to continue to function for an older person of diminished functional capacity. It has been estimated that about one million households in this country headed by an older person lack some type of adaptive feature needed by a resident (Struyk and Zais, 1982).
5. Most older persons prefer to continue living in their own home (AARP, n.d.). Inability to provide maintenance may prevent them from keeping this housing. Huttman reports that "unable to keep up with maintenance of own home" was one of the most frequently cited reasons for moving to a retirement home (1977).

Decreased home maintenance also has implications for the community as a whole. Large numbers of homes that are occupied for extended periods by household members who fail to provide necessary maintenance can have a blighting influence.

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This research: 1) compares the amount of home maintenance and repair work undertaken by older and younger home owners, and 2) identifies variables that explain age-related differences in home maintenance activity. The methodology and findings are based on a model consisting of several major elements. (see Figure 1).

#### Model

If older home owners display less home maintenance behavior, is it solely because of owner age, or is it because there are certain factors that affect home maintenance behavior which vary with the age of the owner? The framework presented in Figure 1 has been developed to help identify factors that influence a decision to either accept a maintenance deficit in the home or take action to alter that condition.

#### Home Maintenance Behavior

Maintenance behavior (MB) is broadly defined to include any work that maintains or extends the useful service life of a home or adapts it to the needs of an occupant. The owner may do the work or arrange for the work to be done.

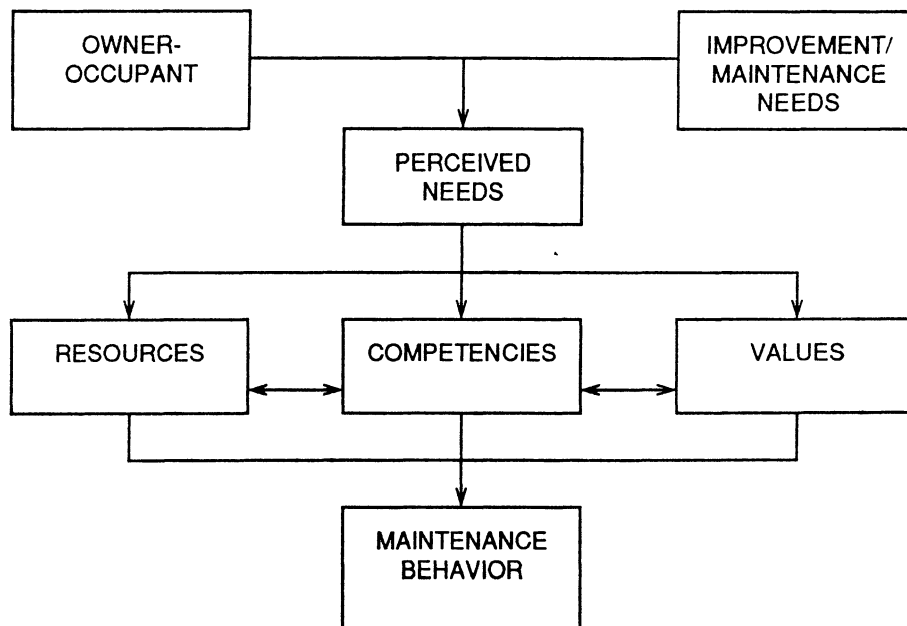


Figure 1. Framework for the Study of Home Maintenance Behavior

#### Maintenance Need

A maintenance need is defined as a defect in the home that reflects a failure to take corrective action. Items that fail to meet building codes but appear to be long-standing design defects are not included if they do not affect the functioning of the home. For example, if a room lacks the required number of electrical outlets, that will not constitute a deficiency. However, if the shortage of outlets results in an inappropriate use of extension cords, that will constitute a deficiency.

### Perceived Needs

Human factors may intervene between the physical deficit in the home and the owner's recognition of the deficit. Before home owners can engage in maintenance behavior, they must be aware of a deficit. Struyk and Devine (1981) compare the repair needs reported by home owners and those reported by an interviewer/observer. Observers report 40 percent to 67 percent more defects than owners. There are several aspects of perception that can result in a maintenance need not being recognized by the home owner:

1. Visual acuity. The person has to be physically able to see the defect. This means having the visual acuity to detect the offending condition. For example, could one see a water stain on the ceiling?

2. Motor capacity. The person also must have the motor capacity to go to the location where the deficit exists and position the head and body so that the eyes can detect the deficit.

3. Previous experience. The person must interpret the condition as a maintenance deficit. For example, if the owner does not recognize that a water stain on the ceiling could be symptomatic of a leaking roof, then he or she may not take action. The person's knowledge of construction practices and previous experience with similar conditions will have an affect.

4. Adaptation. A final category of perceptual influences is illustrated by the wallcovering that gradually fades and accumulates stains. The need to replace the wallcovering may not be detected by the owner, who has occupied the space while the wallcovering has gradually deteriorated. This influence, which will be referred to as adaptation, can be a particular problem for certain types of housing defects and for older home owners who have typically lived in their homes for many years (AARP, n.d.).

Until the home owner is aware of a maintenance need, the other classes of variables do not come into play. Once the need has been identified, the other classes of variables will affect how the need is evaluated and acted upon. In other words, perceptual processes serve as a first screen. Resources, competencies and values serve as subsequent screens. A perceived need must filter through each of these screens. The framework does not attempt to specify the order in which these subsequent screens filter needs. Furthermore, all screens will have an impact on whether a perceived deficit is translated into home maintenance behavior.

### Resources

Research on MB often focuses on the impact of resource constraints. Household income is often the primary resource constraint considered (Niemeyer and Morris, 1986; Walden and Meeks, 1982). There are three socio-economic factors which can have an impact on maintenance behavior:

1. Income. A lack of financial resources is surely a constraint on the purchase of materials or maintenance services. However, in some cases a lack of money may be a convenient explanation for what may be a more complex decision regarding priorities.

2. Household size. Additional household members can be expected to increase the amount of maintenance behavior. There will be more persons to identify deficits and do the work.

3. Community resources. It is also possible that availability of public or private services to help with maintenance work may affect maintenance behavior. For example, many urban areas have non-profit or public agencies that provide help to needy households. Such agencies may not be available in rural areas. Struyk and Devine (1981) state that rural, elderly owners are much less likely to report making repairs than urban home owners (29 percent versus 82 percent).

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### Competencies

Competencies are intra-personal variables that may affect home maintenance behavior. They include sex, home maintenance skill, educational level and health:

1. Sex. While the sex of a respondent should have no inherent effect on a person's ability to accomplish MB, there are traditional role expectations that have had a practical impact on the amount of maintenance work women have done. These role expectations can have an impact on reports of MB by older home owners, particularly women.

2. Skill and previous experience. Skill or previous experience with MB can affect one's confidence to undertake future MB (Meeks and Firebaugh, 1974; Thee, 1985; Coveney and Rudd, 1986). This impact is distinct from that referred to earlier, which was the "inability to perceive a need due to inexperience."

3. Education. To the extent that home owners hire maintenance work done or have to read documents and make decisions using complex information, educational level seems likely to impact MB.

4. Health. Various aspects of the owner's health can affect not only the perception of defects but the ability and confidence to undertake MB. Limitations of strength, mobility, and sensory ability can have a direct impact on capacity as well as on the willingness to attempt to undertake tasks that may involve risks. Risks may be personal or financial such as climbing a ladder or selecting a major purchase like a furnace. In addition to fewer reports of MB, impaired health can also result in a lower percentage of work being done by the owner. Parrott (1988) reported that elderly households did significantly less work themselves.

### Values

The final class of mediating variables is values:

1. Orientation toward housing. Is the house viewed as an investment or a stream of services (Meeks and Firebaugh, 1974)? If the house is seen as an investment then it may be considered critical to keep up the structural integrity of the house to maintain its value. On the other hand, if the house is viewed as something to be used, then comfort and appearance might be more important.

2. Expected remaining tenure. If an owner expects to move soon, the incentive to invest in the home may be different than if the expectation is to remain for many years.

3. Maintenance standards. If a person is satisfied with the house, there may be less incentive for MB. If a person feels that his or her house is better or less-well maintained than surrounding homes, then that again could affect the incentive for MB.

### Method

#### Sample

In the summer of 1983 the Wisconsin Department of Development commissioned the University of Wisconsin Survey Research Laboratory to conduct a survey of home improvement trends. The sample consisted of 1,023 Wisconsin households. It was stratified to reflect geographical population distribution and the ratio of owners to renters found within the state. There were 722 home owners included in the sample. The data were collected for purposes other than this research and did not include measures of every variable outlined in the model (Figure 1). Nevertheless, they do provide measures for many of them.

Home owners were asked about the improvements made to their homes over the previous two years and those planned over the following two years (1983-1985). Socio-demographic data were collected, and energy conservation efforts were singled out for special attention.

### Primary Independent Variable

For the purpose of the present analysis, home owners were assigned to one of two groups based on their age. One group included all respondents who indicated their age was less than 65. The second group included persons 65 and older. This yielded a sample of 585 younger home owners and 137 older home owners.

### Dependent Variables

Four measures of home maintenance behavior were utilized. For each measure the name assigned to the variable is given. The wording of the question is provided followed by the response categories:

1. Energy-related improvements - "Have you done anything to conserve energy over the past two years?" (yes or no)
2. General improvements - "Apart from work done to conserve energy that we have already covered, have you completed any major repairs or improvements to your home during the last two years?" (yes or no)
3. Amount spent on energy-related improvements - "About how much, if any, do you estimate you have spent on energy conservation improvements in the last two years?" (dollars)
4. Amount spent on general improvements - "About how much money, if any, do you estimate you spent on these other major repairs and improvements to your home during the last two years?" (dollars)

### Secondary Independent Variables

The survey provided no objective measures of maintenance needs. Therefore, the correlation of home maintenance needs and age of owner could not be analyzed. Consequently, for the purposes of this research, it was assumed that the distribution of home maintenance needs is not affected by the age of the home owner. This is consistent with previous research that has reported only minimal differences in maintenance needs relative to the age of the occupant (Turner, et. al, 1982).

Perceived Needs. Two measures relating to perceptual difference were available:

1. Awareness of home improvement needs. Respondents were asked if there were any general improvements and any energy-related improvements they would like to make to their homes. The response categories were yes and no. Owners who indicated improvements they desired to make to their homes were hypothesized to have been more likely to report MB.
2. Length of tenure. Respondents were asked how many years they had lived in their homes. It was hypothesized that as tenure increased so would perceptual adaptation. Therefore the likelihood of reporting MB should decrease.

Resources. Four resource measures were used:

1. Income. Respondents were given a list of income brackets and asked which bracket best described their total family income before taxes. Because there were few observations for some of the original income levels when subdivided by age, for the present analysis the data were aggregated as follows: A. less than \$10,000; B. \$10,000 to \$14,999; C. \$15,000 to \$19,999; D. \$20,000 to \$29,000; and E. \$30,000 and over. It was hypothesized that the likelihood of reporting MB should increase with income.
2. Household size. Respondents were asked how many adults, including themselves, lived in the household. Because the number of households with more than two persons was limited for the older group, all households with more than two persons were considered as one group. The percentage of households reporting MB was hypothesized to increase as household size increased.

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3. Trouble completing work. Respondents were asked if they had problems completing the work. The response categories were "had trouble", "did not have trouble" and "did most of the work." Older owners were hypothesized to report doing less of the work themselves and more often report trouble completing the work.

4. Location. Respondents were asked to indicate their county of residence. They were assigned to one of two groups, urban or rural, depending on the location of their county of residence within a Standard Metropolitan Statistical Area. This provided approximate categorization of urban-rural. Some counties could be categorized as urban while containing substantial portions that are many miles from an urbanized area. It was hypothesized that rural households would have less access to maintenance services and, therefore, be less likely to report MB.

Competence. There are two questions in the survey that allow an examination of the impact of competence:

1. Sex. The interviewer coded the respondent as either female or male. Female owners were hypothesized to be less likely to report MB than male owners.

2. Education. Respondents were asked for the highest year of school they had completed. This information was divided into three categories. The first was 8th grade or less, the second was one to four years of high school and the third was one or more years of college. The chances of reporting MB were hypothesized to increase as education level increased.

Values. There were several questions on the survey that related to values:

1. Reason for improvement. Owners who reported making a general home improvement were asked to give a reason for their action. The categories were: A. easier to sell; B. improve appearance; C. more comfortable; D. reduce utility bills; E. combination; and F. other.

2. Value of improvement. A related question asked whether the owner expected to recover the cost of the improvements when the house was sold. The categories were: A. cost returned when house sold; B. house worth more but not as much as cost; and C. value not increased. It was hypothesized that a belief that improvements would make the house easier to sell or increase its value could be a powerful motivator for MB.

3. Expected tenure. The third question asked how long the person expected to remain in the home. The response was given in years and months. Owners who expected to remain living in the home longer were hypothesized to be more likely to report MB.

#### Analysis

The analysis focused on identifying variables related to home maintenance for which there were significant differences between younger and older respondents. Since most of the data were categorical variables, chi-square tests were the primary method of analysis. T-tests were calculated for continuous variables. A maximum probability of  $p < .05$  was used to determine if differences were significant.

#### Findings

##### Primary Variables

Total Expenditure For Home Improvement. For the overall sample, 31 percent reported completing a home improvement during the previous 2 years. The mean expenditure for those making general improvements was \$3,500, (s.d. = 57.09). The most common improvements reported were exterior painting or siding repairs. About 16 percent of all respondents reported such repairs. Roofing repairs and door-window repairs were reported by about 14 percent. Sixty-six percent reported energy-related improvements with a mean expenditure of \$1,340, (s.d. = 21.09). Some type of insulation work was most common. It was reported by 39 percent of owners.

Maintenance Behavior by Age. The primary hypothesis of this paper is that older home owners exhibit less home maintenance behavior than do their younger peers. Responses from owners in this sample, though inconclusive, tend to support this hypothesis.

Approximately 25 percent of the older respondents reported making general improvements compared with 32 percent of their younger peers. While the data trend tends to support the hypothesis, the chi-square test indicated that the difference was not statistically significant.

There was an age-related difference in the amount spent on general improvements. Younger respondents who made improvements reported spending an average of \$3,633, (s.d. = 58.92) on general improvements, while the mean expenditure for older persons was \$2,763, (s.d. = 44.86). Although the difference in means was not statistically significant, the distributions of expenditures were marked. Nearly three-quarters (73.4 percent) of the older respondents reported spending less than the median of \$2,000 while only one-half (50.4 percent) of the younger respondents spent less than that amount.

There was also an age-related difference in the amount of money spent on energy-related improvements. The difference in the number of respondents reporting energy-related improvements was statistically significant. Of the younger respondents, 69.5 percent reported energy-related work as opposed to 53.3 percent of the older respondents (chi-square = 13.13;  $p < .001$ ) (see Table 1).

Younger respondents reported spending an average of \$997 (s.d. = 21.20), while the mean expenditure for older respondents was \$895 (s.d. = 8.95). The difference between the means was not statistically significant. However, the variance did differ significantly (chi-square = 6.08;  $p < .05$ ).

Table 1. Owner reported maintenance by age.

Measure	Under Age 65 N = 585	Age 65 and over N = 137
<b>General Improvements</b>		
Percent of respondents	32.2	25.5
Average dollars spent	3963	2763
<b>Energy-Related Improvements</b>		
Percent of respondents*	69.5	53.3
Average dollars spent	997	895

\*chi-square = 13.12;  $p < .001$

#### Secondary Variables

There are several classes of variables that should affect the amount of MB reported by determining the extent to which age-related differences in MB are associated with the proposed mediating variables. The two frequency measures of maintenance behavior (general improvement and energy-related improvements) are used as the dependent variables for this analysis. While these two measures are strongly related (chi-square = 33.04;  $p > .001$ ) nearly half the sample (47.2 percent) reported one but not the other.

Perceptual Ability. Contrary to expectations, owners who identified desired general improvements did not report previous general improvements. Only 35.5 percent of these owners did so (chi-square = 6.41;  $p < .05$ ). On the other hand, owners who identified energy-related improvements did report previous energy-related improvements. Of these owners, 75.4 percent reported energy-related improvements in the previous two years (chi-square = 20.75;  $p < .001$ ).

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Of the younger respondents, 40.8 percent indicated that they desired to make general improvements to their homes as opposed to only 14.7 percent of the older respondents (chi-square = 32.61;  $p < .001$ ). For energy-related improvements the percentages were 52.5 percent for younger owners and 28.2 percent for older owners (chi-square = 25.20;  $p < .001$ ).

The difference in desire to make general improvements could represent a difference in the maintenance deficit in the home rather than any perceptual effect. Age of the home was the only measure in the data set that allowed a potential check on this. Older homes were expected to need more maintenance as systems either wore out or became obsolete (Garner, 1983). The homes of the older home-owner group were significantly older than those of the younger group. The mean home ages were 42 years (s.d. = 29.06) and 33 (s.d. = 28.34) years respectively ( $t=3.17$ ;  $p < .01$ ).

Table 2. Percentage of owners desiring general improvements by age of home and age of respondent.

When Constructed	Under Age 65		Age 65 and over	
	N	Percentage	N	Percentage
Before 1940 (>43)	155	45.8	50	26.0
1940-1949 (43-34)	43	39.6	0	0
1950-1959 (33-24)	68	41.2	21	9.5
1960-1969 (23-14)	83	47.0	23	4.3
After 1970 (<14)	212	34.0	27	14.8

\*chi-square = 6.13;  $p < .05$

A three-way contingency table was constructed to determine whether the difference between the two age groups desiring to do additional home maintenance work persisted when the effect of the age of the home was removed (See Table 2). For each category of home age, there was still a substantial difference (by owner age) in the percentage of owners desiring to do general home improvement work. For owners with older homes, the age difference was statistically significant (chi-square = 6.13;  $p < .05$ ). There was no obvious relation between the desire for other improvements and age of home .

Tenure. Respondents who had lived longer in their homes were expected to notice fewer general-improvement needs because conditions that had developed gradually over their tenure were not detected. Younger respondents reported a mean tenure of 10 years (s.d. = 11) while older respondents reported living in their homes an average of 24 years (s.d. = 24). A t-test showed the difference between these means to be significant ( $t = 11.8$ ;  $p < .001$ ).

To see whether length of tenure accounted for age-related difference in the desire for improvements, length of tenure was cross-tabulated with age and desire for general improvement (See Table 3). For the sample as a whole, the desire for additional general improvements did decrease with length of tenure from 45.3 percent for persons who have lived in their homes for less than five years, to 22.7 percent for persons who have lived in the same home for more than 20 years (chi-square= 13.39;  $p < .001$ ). However, the number of observations per cell for the older sample were too small to produce any useful results (see Table 3).

Table 3. Percentage of owners desiring general improvements by expected duration of continued residence and age of respondent.

Expected Duration	Under Age 65		Age 65 and over	
	N	Percentage	N	Percentage
5 years or less	223	45.3	11	9.1
6 - 10 years	139	39.6	23	21.7
11 - 20 years	138	38.4	28	7.1
21 - 30 years	56	39.3	35	11.4
30 years or more	22	22.7	38	21.0

Income. A lack of financial resources was frequently cited as the primary reason for a low level of MB. Since elderly households typically have lower incomes than younger households, income differences might explain differences in MB due to age. (U.S. Senate, 1984). Only 9.5 percent of the younger owners were in the lowest income group (under \$10,000) while 47.2 percent of the older owners were in this category.

Table 4 displays the relationship between reported improvements and age of owner for different income groups. Chi-square tests indicated that age differences in the number of low-income owners reporting general improvements and energy-related improvements were not statistically significant. Chi-square tests were also performed to determine if low-income home owners in general reported MB less frequently than higher-income owners. For both MB measures the differences were not significant. While income appeared to affect MB, income differences by no means explained all the age-related difference in MB. Age differences persist within income groups.

Table 4. Percentage of owners reporting home maintenance behavior by income and age.

Income	Under Age 65			Age 65 and over		
	N	General	Energy-Related	N	General	Energy-Related
Less than \$10,000	51	19.6	66.7	51	11.8	54.9
\$10,000-14,999	64	17.2	60.9	27	18.5	44.4
\$15,000-19,999	78	29.5	69.2	13	23.1	76.9
\$20,000-29,999	150	39.7	76.7	10	30.0	70.0
Over \$30,000	194	31.4	71.1	7	14.3	85.7

Number of Occupants. Only 10.3 percent of the younger respondents reported living alone as opposed to 31.4 percent of the older respondents. This difference was statistically significant (chi-square = 42.51;  $p < .001$ ). As Table 5 indicates, for both age groups fewer respondents living in single-person households reported making general improvements. The pattern was the same for older households reporting energy-related improvements. However, more younger persons living alone reported making these improvements. In no case were these differences statistically significant (chi-square).

Smaller households would generally have less help available to participate in identifying problems, deciding on a course of action, and carrying out the work. Older persons were more likely to live alone. Therefore, fewer household members might explain some of the age-related differences in MB.

Labor Source. Of the older owners who made general improvements, 28.6 percent reported doing their own work. The percentage for the younger group was nearly twice as large (51.6 percent). Chi-square results indicate that this difference is significant at the .05 level.

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Table 5. Percentage of owners reporting home maintenance behavior by household size and age of respondents.

Household Size	N	Under Age 65		N	Age 65 and over	
		General	Energy-Related		General	Energy-Related
1 Adult	60	31.6	76.7	35	17.1	42.8
2 Adults	378	34.9	70.4	67	30.0	50.7
More than 2 Adults	130	25.4	62.3	13	23.8	76.9

Only five owners reported any problem finding a contractor to do the work. This suggests that there was not a problem finding someone to do the type of improvements covered by the survey.

Rural/Urban. Table 6 reveals that fewer rural owners reported general improvements or energy-related improvements than did their urban counterparts. The difference between age groups was small for general improvements (3.3 percent). The difference in energy-related improvements was more substantial (47.6 percent). However, neither difference was statistically significant (chi-square).

Among the rural owners, there was virtually no age-related difference in the number of respondents reporting general improvements (28.5 percent for the younger owners and 28.8 percent for the older group). There was an age-related difference in the number of owners reporting energy-related improvements. For the younger group, 65.4 percent reported energy-related improvements while 52.5 percent of the older group reported such improvements. The difference was not statistically significant (chi-square) (see Table 6).

Table 6. Percentage of rural and urban owners reporting home maintenance behavior by age of respondent.

	N	Under Age 65		N	Age 65 and over	
		General	Energy-Related		General	Energy-Related
Urban	185	33.8	71.4	159	21.6	55.4
Rural	399	28.5	65.4	74	28.8	52.5

Sex. For the sample as a whole there were 302 male respondents and 420 female respondents. There was little difference in the number of owners reporting either general improvements or energy-related improvements for this variable. In the case of general improvements the difference was 3.6 percent with more females reporting improvements. In the case of energy-related improvements the difference was .4 percent.

Among the older owners a higher percentage of females report undertaking both types of improvements. However, the differences were not statistically significant. The difference between older males and females was 1.3 percent for general improvements and 5.7 percent for energy-related improvements.

Education Level. Owners without any high school education reported involvement with both types of MB less often than did owners with at least some high school education. Owners with post-secondary education exhibited the highest percentage of MB. The difference between groups with the least education and the most was 12.2 percent for general improvements and 20.6 percent for energy-related improvements. Only the latter difference is statistically significant (chi-square = 14.17;  $p < .05$ ).

There were nearly six times as many older owners in the low-education group (34.6 percent for the older group and 6.2 percent for the younger group) (chi-square = 75.5;  $p < .001$ ). This difference suggested the possibility that lack of education might be one of the age-related factors accounting for older owners reporting less MB (see Table 7).

Table 7. Percentage of owners reporting home maintenance behavior by age and educational level.

Education	Under Age 65			Age 65 and over		
	N	General	Energy-Related	N	General	Energy-Related
Eighth grade or less	39	20.5	56.4	45	26.6	44.4
At least some high school	296	30.4	67.6	59	20.3	62.7
At least some college	240	36.2	73.8	32	34.4	46.9

In an attempt to explore this possibility, education and MB were analyzed separately for each age group. For the younger owners, reports of both measures of MB did increase with educational level. However, the effect was not statistically significant (chi-square). For older owners the relationship between MB and educational level was inconclusive.

**Value.** Few owners (less than 5) indicated that they were motivated by the beliefs that the home would be easier to sell or that the improvement would reduce utility bills. "More comfortable" was the most frequent reason for MB. It was given by 48.0 percent of those who made improvements. "Improve appearance" was given by 14.8 percent. Respondents were allowed to cite a combination of reasons and 26.5 percent did so. Reasons given by older owners varied little from those offered by younger owners.

Owners who had made general improvements were asked if they believed that those improvements had increased the value of their homes, and 85.5 percent believed that they did. Significantly fewer of the older owners questioned held this belief. Sixty percent of the older owners believed that their home had increased in value as compared with 90.3 percent of the younger owners (chi-square = 21.87;  $p < .001$ ). This suggested that the older owners were less likely to be motivated to undertake MB by expectations of financial returns. Since the question was only asked of those respondents who had made general improvements, it was impossible to determine whether the expectation of increased property value was associated with a greater chance of making improvements for the sample as a whole.

**Expected Duration of Continued Residence.** Although 27.9 percent of the sample expected to move within the next 10 years, there was a statistically significant age-related effect on this response. Only six percent of the older owners expected a move compared with one third of the younger owners (chi-square = 34.35;  $p > .001$ ).

Owners who expected to move within 10 years were more likely to report general improvements and energy-related improvements. The effect due to expected duration of continued residence on energy-related improvements was statistically significant (chi-square = 9.45;  $p < .01$ ) (see Table 8).

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Table 8. Percentage of owners reporting home maintenance behavior by expected tenure.

Expected Tenure	N	General Improvements	Energy-Related Improvements
Less than ten years	165	35.8	75.8*
Ten years or more	426	29.1	62.7*

\*chi-square = 9.45;  $p < .01$

### Discussion

The results offer support for the hypothesis that older owners (age 65 and over) do less work on their homes than younger owners. Older owners are less likely to report making both general improvements and energy-related improvements. They also report spending less in each category. These differences are much larger for energy-related improvements.

Effects due to age might have been more pronounced if the older owners could have been divided into younger old and older old. In many cases the younger old are in good health and have the time to engage in MB. The latter group may well be responsible for differences in MB due to age. Unfortunately, in this study the number of owners age 75 and over (usually considered older old) is too small to allow separate analyses.

The research framework proves helpful in identifying variables in the data set that can be expected to influence MB. It also makes clear some limitations of the data. The most important limitation is that there was no owner-independent measure of the condition of the house upon which to evaluate the importance of owner perception. A number of the other questions that addressed value issues have limited utility because they were only asked of persons who reported MB.

Nevertheless, a number of differences between older and younger home owners are identified in this study:

1. Older owners are less likely to report having identified desired improvements. This is true even when older owners live in older, presumably more needy, homes.

2. Older owners have lived in their homes longer. For the sample as a whole, owners who have lived in their homes for more than twenty years are less likely to perceive the need for additional general improvements than are owners who have lived in their homes for five years or less.

3. More older owners are in the lowest-income group, and it appears that low-income owners were less likely to report either type of MB. However, older persons in most income brackets appear less likely to report MB.

4. More older persons live alone. However, there are no consistent differences in MB among different household sizes.

5. Older persons are less likely to report doing work themselves. However, more than one-quarter of them do report making their own improvements.

6. Older rural owners appear to report energy-related improvements less often than younger rural owners. Rural owners in general appear to report energy-related improvements less often than urban owners. For general improvements, the differences between urban and rural owners is small.

7. Contrary to expectations, older female owners are as likely to report MB as their male counterparts. The same is true for the sample as whole.

8. Older owners have less education and persons with less education are less likely to report MB. The effects are small for general improvements but substantial for energy-related improvements.

9. There are no age-related differences in the reasons given for making general improvements. The most common reason is to increase comfort. On the other hand, older persons are less likely to believe that improvements have increased the value of their homes.

10. Older owners are more likely to expect to continue living in their home for many years or the rest of their lives. Contrary to expectations, owners with this view are less likely to report MB. These differences persist at a lower level when older owners are considered separately.

It appears that a number of factors contribute to the differences between older homeowners and their younger peers. The analyses are helpful in identifying factors that appear more important than others. For example, sex of respondent and household size do not appear critical. In contrast, desire for improvements, expected duration of continued residence, education, and expectations that improvements will increase the value of the home show strong differences due to age. A logical next step in this research may be the use of multivariate analysis to explore the relative strength of various factors.

The results of the study suggest that causes of home maintenance behavior are multifaceted. The strength, and some cases direction, of the relation between the two measures of MB and the various independent variables are frequently different. This suggests that it may be useful to distinguish various subcategories of MB and study the factors that contribute to them separately.

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