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A research note on:

INTEREST AND PARTICIPATION IN ENERGY AUDIT PROGRAMS

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ABSTRACT

In this study Idaho residents are asked about their willingness to have an energy audit. The answers are cross-tabulated by age, education, tenure, and number of square feet in the home. Willingness to have an energy audit is positively correlated with education, home ownership, and size of home. Age and willingness to have an audit are negatively related. Extensive energy-conservation education including an explanation of the benefits a weatherization program provide is suggested.

INTRODUCTION

Few issues in the last fifteen years have received the attention of Americans as has the issue of the supply and cost of energy. Energy has become an increasing concern of the American public as the costs of energy rise. Although energy conservation was not extensively implemented in homes until the 1973 Arab oil embargo, conservation has become a way of life to many Americans coping with higher energy costs. Prior to 1973, the low cost of energy and its availability did not encourage people to conserve.

Energy costs for the average family were 13 percent of income in 1980 and may increase to 20 percent of income by 1990 (Pusey, 1978). How much energy costs rise as a proportion of a family's budget depends on the rate at which energy costs increase. People, in many cases, are adjusting their lifestyles to allow for the increased costs of energy. Until the last decade, much of the housing in the United States was constructed with the assumption that energy would always be cheap and plentiful. Little attention was paid to energy saving measures.

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Considering that 14 percent of the total energy consumed in the United States is used for heating and cooling homes, the potential for energy savings can be substantial. Much of the energy used in the heating of homes can be saved by plugging warm air leaks, adding insulation, tuning the furnace, improving windows and adding window insulation treatments.

To achieve energy savings, cost-effective measures for a particular residence need to be considered. An energy audit, which inspects each home for energy efficiency, can result in a considerable savings of energy. Utility companies, as well as many private firms, offer energy audit programs. A major factor in the success of such programs is whether residents are willing to have their homes inspected and then take the measures recommended. Becker (1981) reported that few people had taken advantage of energy audits offered by utility companies.

METHODS

A survey was conducted in ten Western states entitled "Energy Direction: A Western Perspective" (Dillman, Tripple, Makela, Dillman, and Chatelaine, 1981). A portion of the data obtained in that survey was used in this study. The purpose of this study is to obtain a picture of Westerners' attitudes and responses to the energy situation. The Western states were studied separately because, as a group, they have less rainfall, more temperature variation, longer commuting distances, and larger rural populations than the Eastern states. For the purpose of this study, the data from Idaho were used. Idaho's population is 82 percent rural with only one major urban area, Boise, which is a Standard Metropolitan Statistical Area.

The data were collected by the Cooperative State Research Services of the United States Department of Agriculture and the Agricultural Experiment Stations of each participating state. In Idaho, 1,500 questionnaires were mailed in the spring of 1981. Eight hundred thirty-four usable returns were obtained. The number of responses (N) differed slightly from table to table because not all respondents answered all survey questions. The participants in the study were chosen by a random sample taken from telephone directories. By sending half of the questionnaires to rural residents and half to urban residents, the sample was stratified. Because of the high percentage of rural residents in Idaho, the data were weighted by the portion of the state's population living in each population stratum.

The respondents were questioned about their willingness to have their home inspected for energy efficiency (the dependent variable). Three categories were used: 1) Done now (already had an audit), 2) Plan to do (within two years), and 3) No plans to have an energy audit in the future. The responses to this question were then cross-tabulated by the independent variables: age, education, tenure, and number of square feet in their home. The relationship between each independent variable and willingness to have an energy audit was examined separately using percentage differences and the chi square test of significance.

FINDINGS

Table 1 shows the relationship between age and having a home energy audit. The chi square significance level of <0.001 indicates there is a very significant relationship between the two variables. The influence of age particularly can be seen in category 1 and 3. The youngest group has the highest percentage of respondents planning to have an audit within two years. The oldest group has the highest percentage who have no plans to have an audit. A first order cross-tabulation controlling for income showed middle income groups in all age categories to be the most receptive (0.01) to the energy audit program. In all age groups, however, high percentages (55-71%) indicated that they are not willing to have an audit.

Table 1. Energy audit situation by age.

	Age grouping			Total
	Under 34	34-53	54 and over	
Audit situation				
Have had an audit	18%	16%	15%	16%
Plan to have an audit	27	22	14	20
Have no plans for one	55	62	71	64
Total	100%	100%	100%	100%
Number	(191)	(249)	(264)	(704)
Chi square level of significance	<0.001			

Table 2 shows the relationship between education and having a home energy audit. The chi square significance level of <0.001 indicates that the relationship between the two variables is significant. Those with a high school education or less are much more likely to have no plans to have an energy audit (76%) than those with education exceeding the high school level (56-58%). At all educational levels, only a small percentage (12-20%) have participated in energy audit programs. The majority of respondents indicate that they have no plans to have an energy audit in the future.

Table 3 shows the relationship between tenure and having an energy audit. The chi square significance level of 0.02 indicates that there is a significant relationship between the two variables. Home owners are more likely to have had an audit or plan to have an audit than are those who rent.

Table 2. Energy audit situation by education

Energy audit situation	Education			Total
	High school or less	Trade school or some college	College graduate	
Have had an audit	12%	20%	15%	16%
Plan to have an audit	12	22	29	20
Have no plans for one	76	58	56	64
Total Number	100% (262)	100% (259)	100% (162)	100% (683)
Chi square level of significance	<0.001			

Renters have less control over whether their residence has an audit than do home owners. To perform an audit, the landlord's permission is required in many cases. Some landlords show reluctance to allow the inspection for energy efficiency (Counihan, 1981). In one recent program in the Northwest, the utility company pays 60 percent of the cost of energy saving improvements for rental units heated primarily by electricity. The landlord then pays the other 40 percent.

Table 3. Energy audit situation by tenure

Energy audit situation	Tenure		
	Rent	Own	Total
Have had an audit	8%	17%	16%
Plan to have an audit	14	21	21
Have no plans for one	78	62	63
Total Number	100% (75)	100% (604)	100% (679)
Chi square level of significance	0.02		

Meeks (1978) reports that home owners are more aware of energy costs than are renters. The fact that one-third of the nation's residences are rentals (Counihan, 1981) could have a large impact on energy consumption. Hutton (1978) also reports that renters had not

widely adopted energy-efficient practices. According to Table 3, twice as many owners as renters have had an audit and 50 percent more owners than renters plan to have one within two years. With both renters and home owners, however, high percentages (62% and 78%) have no plans to have an energy audit in the future.

Table 4 shows the relationship between size of the home and willingness to have an energy audit. The chi square significance level of <0.001 indicates a significant relationship. When size of the dwelling is 1000 feet or less, participation in audit programs is minimal. Participation is slightly higher (by 7%) in larger dwellings. Regardless of the size of the home, however, the majority indicate they had no plans to have an energy audit.

Table 4. Energy audit situation by size of home.

	Square footage of home			Total
	1000 or less	1001- 2000	2001 or more	
Energy audit situation				
Have had an audit	11%	18%	18%	16%
Plan to have an audit	14	22	26	20
Have no plans	76	61	57	64
Total	100%	100%	100%	100%
Number	(172)	(378)	(133)	(683)
Chi square level of significance	<0.001			

SUMMARY AND DISCUSSION

The principal finding in this study is the lack of interest shown in participation in energy audit programs. In all four of the relationships examined, age, square footage of residence, tenure, and educational level, a large proportion of respondents neither have had nor have plans to have an energy audit.

Older respondents are less willing to have an audit when compared to younger respondents. Willingness to have an audit is higher among the more educated than among respondents with less education. Those who own their residence are much more likely to have an energy audit than those who rent. The more square footage in a home, the more likely the residents are to have an energy audit.

These trends have important implications for energy audit programs. The middle-income groups in all age categories are the most receptive to energy audits. The findings suggest that those with a high school education or less would be a good group to target for energy conservation programs since they have the highest percentage of people with no plans to participate in energy audit programs in the future (see also Jones, 1980). Recent programs for landlords offered by utility companies will probably have an effect on the results obtained in future

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studies of energy use and renters as more landlords take advantage of the programs. Those with larger homes will probably continue to be the most responsive to audit programs since, as a home becomes larger, more energy must be used to keep an home comfortable.

Utility companies and private firms offering energy audits need to work together with educators to discover the reasons for not having an audit, to educate the public about the energy audit programs and to implement the recommendations given in an audit. It might be effective to change the name from energy audit to terminology that is less threatening. The term "audit" may have negative connotations for many people. One major utility in the Northwest (Washington Water Power) is calling their inspection "The weatherization program". This may lead to increased acceptance of the program by the consumer and lead to decreases in energy consumption. Further research needs to be undertaken to discover why high percentages of respondents are not willing to be audited.

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