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ABSTRACT

To determine the relationship of various forms of communication to adoption of energy conservation behavior among homeowners, and to compare the energy conserving behavior of those under 65 with those over 65, a three-year panel study was conducted in a Midwest suburban community. Heads of households who owned single family dwellings were contacted by telephone concerning the steps they had taken to conserve energy in their homes, such as adding attic insulation or turning down the thermostat. Respondents also answered questions about what forms of communication they relied on, whether they had seen any energy conservation commercials recently or had requested a utility audit, and those who were willing also released their public service heating records. Results showed that those over 65 were less willing to take steps to conserve energy, kept their thermostats set higher than younger respondents, and had fewer plans to conserve energy in the future, though the two groups had equivalent knowledge of energy problems and conservation measures. Reading newspaper stories and viewing television programs about energy conservation were strongly related to the perceived importance of the energy problem, although the more general the information, the less it was correlated to behavior. Those over 65 were more likely to try to conserve energy if a utility auditor visited their home, or if they received bill-insert pamphlets. (Notes, tables, and 27 references are included.) (JC)

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SIXTY-FIVE: COMMUNICATION AND THE ADOPTION OF ENERGY CONSERVATION MEASURES BY THE ELDERLY

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SIXTY-FIVE: COMMUNICATION AND THE ADOPTION OF ENERGY CONSERVATION MEASURES BY THE ELDERLY

Abstract

A three-wave panel study was conducted in successive years in a Midwest suburban community to determine the relationship of communication to adoption of energy conservation behavior among homeowners. Special attention was paid to the communication and energy use constraints faced by the elderly. Analysis indicates that younger respondents adopted actions to save energy in the home at a faster rate than did the older respondents.

This study found that energy-related content in the mass media bears stronger relationships with the perceived importance of the energy problem and energy conservation attitudes than with energy conservation behavior. The latter is associated more strongly with utility pamphlet reading, information requests, and utility audits, which provide the more specific and customized information necessary for implementation of energy conservation measures.

SIXTY-FIVE: COMMUNICATION AND THE ADOPTION OF ENERGY CONSERVATION MEASURES BY THE ELDERLY

In the wake of the recent energy crises, considerable attention has been paid to the plight of the less affluent and elderly. People who must live on low and fixed incomes tend to spend a greater portion of their incomes on energy and are less capable of dealing with higher energy costs. Moreover, the less affluent often live in homes that are not as energy-efficient as homes of the better-off, and this gap in efficiency has widened over time (Brown, 1984).

Durand et al. (1980) found that older persons indeed favor conservation, but perceive that they have reached the limit to which they, personally, could conserve. Retrofitting homes (e.g., insulating walls and attics) can be quite costly, especially on fixed budgets. A national survey (Roper, 1977) found that those over 60 were less likely than other age groups to install weather-stripping, storm doors and windows, add insulation, or to adopt solar heating, even with tax credits. Brown (1984) found that elderly lag in adoption of energy conservation measures, and in particular are less likely to believe that attic insulation is a necessary expenditure.

Various health problems and the risk of hypothermia compound the problem by constraining the extent to which the elderly can safely, and with any comfort, lower their household heat temperatures (Warriner, 1981; Boles and Jackson, 1982; Goldstein, 1982). For persons in their 70's and older, environmental temperatures of 66 degrees (F.) or lower can be dangerous or even fatal (Goldstein, 1982). Thus, the elderly tend to keep their home heat temperatures higher than average (Brown, 1982), and often do so in poorly insulated homes.

Although surveys have found that there are no significant differences by age group in knowledge of the energy situation or in the salience ascribed the energy issue (Farher et al., 1979), the elderly are often poorly informed as consumers (Waddell, 1975) and tend not to be well informed about energy conservation innovations, which may contribute to the lag in adoption (Brown, 1984). The elderly are often among the last adopters of products, services, or ideas, not only due to their constrained economic resources, but also because they are more cautious (Phillips and Sternthal, 1977). Innovators tend to be younger and higher in income (Gatignon and Robertson, 1985).

Communication and the Elderly

The communications ecosystem of the elderly has also been found to differ from that of younger age groups, and that could affect their adoption of energy conservation measures. Based on research on the diffusion of innovations, Rogers (1983) notes that mass media influence is more pronounced at earlier stages of the adoption process (e.g., awareness), but that in later stages (e.g., decision to adopt an innovation or behavior), personal influence is more pronounced. In response to reduced activity, the elderly change their communication patterns, becoming more reliant on mass media as sources of information (Graney and Graney, 1974; Phillips and Sternthal, 1977). Newspapers play a particularly important function for the elderly, Phillips and Sternthal (1977) observe, since reading is self-paced and helps the elderly avoid learning difficulties that can be posed by externally-paced presentations (e.g., television).[1] While the elderly still maintain social contacts, they note, these contacts are usually limited to an extended family and whatever acquaintances are nearby. Such constraints on the opportunities and density of social contacts might reduce the likelihood of personal influence important to the innovation diffusion process, especially regarding later stages of adoption.

Communication and Energy

Studies of the effects of public information campaigns to promote energy conservation have usually found that these more general campaigns may promote awareness, but have little if any effect on promoting energy behavior (see Griffin, 1985). Cunningham and Lopreato (1977) propose that mass media campaigns need to be reassessed in terms of content and means of dissemination, and suggest that the same information in the campaigns would have greater impact if presented personally rather than through mass media. Stern and Aronson (1984) note, however, that the general type of energy savings information usually conveyed by the mass media is usually inappropriate because of the wide variation and mixture of energy conservation problems individual consumers face. Measures that are appropriate for some, in a highly segmented market, are not appropriate for others. Therefore, they note, it is appropriate for consumers to be wary of energy information. Given the caution of the elderly, and the special problems they face in turning down the thermostat and affording many of the commonly suggested remedies for energy waste in the home, the general energy information contained in the mass media may indeed have limited influence on them, even though they may have become more reliant on the mass media.

One means of dissemination that might have played a role in adoption of energy conservation measures is the utility-sponsored energy audit, in which a trained consultant, at the request of the client, comes to the dwelling and diagnoses the specific energy conservation needs of that household. Hirst et al. (1981) found that those having audits generally took more energy conservation actions than those who did not participate. The energy auditor serves the role of a "change agent," which Rogers (1983) describes as a communication link between a client system and a resource system. "One of the main roles of a change agent," he states, "is to facilitate the flow of innovation from a

change agency to an audience of clients. But for this type of communication to be effective, the innovation must be selected to match the clients' needs and problems." It is possible that the auditors, as change agents, may have influenced the adoption of energy conservation measures, even by the elderly, since they could offer customized advice and overcome at least some communication barriers.

Research Questions and Hypotheses

Given this background, the following research questions can be generated:

I. What differences can be found in the energy conservation behavior of younger as compared to older respondents? Given the apparent constraints on conservation behavior by the elderly, we would expect that:

> H1: Younger respondents will adopt conservation behaviors at a faster rate than older respondents, producing a "gap."

II. What differences can be found in energy salience and in energy information holding, needs and interests between younger and older respondents? Although younger and older respondents may consider the energy problem equally salient and be equally knowledgeable about public affairs aspects of the energy issue, the elderly may be deficient in consumer-oriented ("practical") energy knowledge, so that:

> H2a: Older respondents will have lower levels of practical energy knowledge than the younger.

If the younger respondents face fewer constraints on adopting energy conservation measures, and tend to be more innovative, they may feel that even more information about energy conservation measures will still be useful to them. Therefore:

> H2b. As compared to older respondents, younger respondents will perceive a greater need for, and interest in, more information about saving energy in the home.

III. What differences can be found between older and younger respondents in their use of public affairs and energy communication media? Given a shift in media reliance by the elderly, it is proposed:

> H3a. Older respondents will exhibit greater exposure to mass media, especially newspapers, than younger respondents, but less use of interpersonal communication for information about current events.
>
> H3b. Older respondents will exhibit greater use of mass media, especially newspapers, for energy information, but less use of interpersonal sources of information about energy, as compared to younger respondents.

IV. Which media relate to the adoption of energy conservation behavior, especially among the elderly? Given the importance of specific and customized energy information to adoption of energy conservation behavior:

> H4a. Information in communication media more specifically devoted to energy conservation will be more strongly related to adoption than the energy information in more general media.
>
> H4b. Energy audits will relate positively to adoption of energy conservation behavior, especially among the elderly.

V. Which media relate to conservation attitudes, salience, and knowledge among younger and older respondents? Given the reliance of the elderly on newspapers, and the extent to which newspapers may facilitate processing of energy information:

> H5a. Newspaper usage will relate positively to Public Affairs Energy Knowledge among the elderly.

Provided that mass media may more easily affect awareness than behavior, and may have "agenda setting" effects (McCombs and Shaw 1972):

> H5b. Newspaper and television use, and especially processing of newspaper and television information about energy, will be positively related to energy issue salience.

RESEARCH DESIGN

West Allis, a community of 64,000 population in the Milwaukee metropolitan area, was chosen as the research site. Many residents are retired. In addition, a relatively large contingent of working class persons provides some important variance in social status in this suburban community. Since retrofitting homes for energy efficiency (e.g., insulating walls and attics or purchasing a more efficient furnace) can be quite expensive, the impact of the energy problem on persons with low or fixed incomes was particularly worthy of study. Owners of single-family homes were the population of interest since their energy behavior options are relatively unconstrained as compared to residents of other types of dwellings--apartment renters, for example. Heads of households were chosen because of their decision-making roles in the home.

A panel of 351 single-family homeowners in West Allis, Wis., completed telephone interviews beginning in the fall of 1981. The homeowners were chosen by taking a systematic probability sample of owner-occupied residences listed in the city directory, augmented by random-digit dialing in proportion to West Allis telephone exchanges. Respondents were further screened to ensure they lived in West Allis, in single-family homes, owned the homes, and were the male or female heads of the households.

In the fall of 1982, 227 (or 65%) of the original panel members were successfully reinterviewed. An additional set of 181 single-family homeowners, chosen in the same manner as was the original sample, were added as a control for sensitization, bringing the total of interviews conducted in 1982 to 408. In the fall of 1983, 307 (or 75%) of the 1982 respondents were again interviewed. An additional sample of 118 single family homeowners, chosen in the same manner as the others, were added to control for sensitization. In all, 425 respondents took part in the 1983 wave of interviews. All 1982 and 1983 interviewees were screened as in 1981 to ensure that they qualified as respond-

ents. A total of 171 (49%) of the 351 respondents in the 1981 wave remained in the study for all three years. In all, 650 respondents were involved in the study. None of the respondents had been told that they would be reinterviewed.

Respondents in all three years were asked to sign a form (mailed to them) that would allow the local utilities to release data on energy use in their homes for analysis in the study. In all, 314 respondents (48% of the total) complied.

Interviewers in 1981 and 1982 were graduate students and advanced undergraduates trained as members of communication research courses. In 1983, interviewers included graduate students, undergraduates, and members of the community, all of whom received interviewer training. Interviews were conducted in October and November of each year, and were validated by random callbacks.

Measurement

Demographic/Control Variables:

The respondent's age, educational level, income, the age of the dwelling unit, and the number of inhabitants (hereafter referred to as "family size") were measured in all three years of the study. These five variables have been found in other studies and analyses to influence energy conservation behavior, attitudes, saliences, or knowledge either directly or indirectly (see Ritchie et al., 1981; Griffin 1985; Griffin et al., 1985). Education was measured as the number of years of formal schooling completed. As a measure of sensitization, respondents were coded in 1982 and 1983 according to the number of previous years they had been in the study.

The variable of respondent age was dichotomized by breaking at age 65, such that respondents age 65 and above are considered "older," and those under age 65 "younger." About 25.6% of the respondents in 1981, 25.8% in 1982, and 24.4% in 1983, were age 65 or older. These proportions are within sampling error (95% confidence level) of the 24.5% of the community's homeowners reported as age 65 or older in the 1980 census. The close match also gives support to the external validity of the survey.

Dependent Variables:

Energy conservation behavior was measured in all three years by the following measures:

Heat factor is a measure of the amount of energy used to Heat a home per degree day of outside temperature. These data were obtained from the local gas utility, and apply to respondents who gave permission and have gas heat.[2]

Total energy conservation behaviors were measured by counting the actions reported in response to the question: "You have probably heard about things people can do to save energy in their homes. Not everyone can or wants to do these things. Can you recall anything you have done in the past five years to save energy in the home, and about when it was done or when you began doing it?" (Reinterviewed respondents were asked to report just the actions taken in the past year, and the number was added to the previous year's total. Respondents added in 1982 were asked to report activities up to six years previous, and those added in 1983 were asked about activities up to seven years before.)

Thermostat setting was measured by asking respondents the temperature at which their home heating thermostats are usually set in winter during the day (degrees x .5), while sleeping (x .33) and during the evening otherwise (x .17). Weighted temperatures were combined into a single measure and the values reversed for analysis so that higher values represent lower average daily

thermotat settings.

Respondents were also asked if there is anything they are planning to do to save energy in the home, and the proportion they believe they have reduced their household energy consumption in the previous two years. In 1981 and 1982, respondents were also asked the extent they would be able to cut back their use of home heat and of hot water without substantially affecting their standards of living.

Energy Conservation Attitudes were measured by summing, and dividing by five, the ratings on five-point Likert scales for five items (see McLeod et al., 1983):

> To me, it's worth the extra expense to keep the thermostat above 65 degrees. (Reverse scored.)
>
> It is everyone's responsibility to conserve energy: the little things add up.
>
> People who can afford it should be able to buy as much energy as they want. (Reverse scored.)
>
> In my daily life, there is more to be gained than lost by cutting down on the use of energy.
>
> I know science will find an answer before energy problems get too bad. (Reverse scored.)

Based on further testing of the attitude items, the first item was replaced after 1981 by the following (see Becker et al., 1981):

> I am willing to wear heavier clothes indoors in the winter so that I can set my thermostat lower than I otherwise would.

The index is scored so that higher values represent pro-conservation attitudes.

Public Affairs Energy Knowledge was measured by a closed-ended test in the questionnaire that included items concerning knowledge of the energy situation and about energy processes and relationships. (Correct answers are indicated in parentheses arter each item.) The 1981 Public Affairs Energy Knowledge items (see McLeod et al., 1983) were:

What nation produces the most oil annually? The U.S., Saudi Arabia, Iran, or the Soviet Union? (Soviet Union.)

By 1990, the average cost of fuel in Wisconsin is expected to remain the same, increase by 50%, double, or triple? (Triple.)

How much of Wisconsin's electric energy comes from nuclear power? Less than 1%, about 10%, about 35%, or about 75%? (About 35%.)

Would the deregulation of natural gas raise natural gas prices, lower them, or have no effect on them? (Raise.)

Is this statement true or false? If crude oil were not available, there would be no way to manufacture many of our present plastics, synthetic fibers, chemical and other products. (False.)

True or false? At current rates, within 20 years so much of the nation's natural gas will be used up that there won't be enough to heat the homes now using gas. (False.)

After 1981, the first and second questions were dropped and the following items were added:

Since 1979, has the per capita consumption of energy in the United States increased, decreased, or remained the same? (Decreased.)

Which mode of transportation uses the largest share of energy used for transportation? Overall, would you say: railroads, airlines, freight-hauling trucks, or private autos? (Private autos.)

Overall, which fuel provides the largest share of the energy we use in the United States? Would you say coal, natural gas, oil, or nuclear power? (Oil.)

True or false? The earth constantly replaces the reserves of oil, coal, and natural gas as we use them? (False.)

Practical Energy Knowledge was measured in 1982 with the following questions regarding energy use in the home (the last two were dropped in 1983):

True or false? Leaving a light turned on for a few hours actually uses less energy than repeatedly turning it on and off during that time? (False.)

Caulking and weatherstripping can save how much money in fuel bills? Would you say 2%, 10%, 25%, or 40%? (10%.)

Which uses more energy? One 100-watt lightbulb or two 60-watt lightbulbs? (Two 60-watt.)

> Which of the following gives the best payback--that is, which of these comes closest to paying for itself within a year in terms of savings on utility bills? Would you say insulating the walls, insulating the attic, replacing an old furnace, or plugging air leaks by caulking and weather-stripping? (Insulating the attic.)

Respondents in all three years were asked if they believed they needed more information about saving energy in the home. Interest in various types of energy-use information was measured in 1982 and 1983 by asking respondents how interested they are in each of the following types of information: what others are doing to save energy in homes like theirs; how much money energy conservation measures save; how much energy they are using as compared to other homes like theirs; and how much energy they are using as compared to a year earlier.

Energy salience was measured according to the importance ascribed energy as an issue by the respondent.

Communication Variables:

Newspaper exposure is the sum of standardized scores measuring the number of days a week the respondent reads a newspaper and the average amount of time spent when reading a newspaper. Television exposure, similarly, is the sum of standardized scores measuring the number of evenings a week the respondent watches television and the average number of hours spent when watching after 5 p.m.

Newspaper public affairs usage was measured by the sum of standardized scores measuring the frequency that respondents read stories about local and state government and politics, stories about national government and politics, and read editorials. Television public affairs usage was measured by the sum of standardized scores measuring the frequency of viewing national news programs, local and state news shows, and news specials and documentaries. Public affairs magazine reading was also measured by asking respondents what news magazines, if any, they read regularly, and counting the number they named.

Respondents were also asked how much they rely on family and friends for information about current events.

Use of energy communication was assessed by the following variables. Processing of newspaper energy information was measured as the sum of standardized scores of questions determining the likelihood the respondent would read a newspaper article on energy if he or she came across it, and the likelihood that the respondent would "stop and think about ideas in the article" after reading. Processing of television energy information was assessed by summing the standardized scores of questions determining the likelihood the respondent would watch a program about energy, and the likelihood the respondent would "stop and think about the ideas in that program" after viewing. Exposure to energy commercials was measured by a question asking respondents whether they had seen any commercials recently about energy conservation practices. Exposure to utility pamphlets was measured by a question about the frequency that the respondent reads the brochures and pamphlets that come as utility bill inserts. Interpersonal communication about energy was assessed by asking respondents how frequently they discuss energy use in the home with persons who are not a part of the household.

Information seeking about energy was measured by asking respondents if they had recently requested information about energy saving in the home, whether they have had a home energy audit by a utility, and whether they had sought the results of the infrared analysis done of each home in the city, which requires a trip to city hall and a nominal fee. (The infrared question was added in 1982 and 1983.)

Statistical Analysis

Multiple classification analysis was used to examine differences between groups of older and younger respondents in levels of variables of interest in the study for each of the three years. Partial correlation was used to examine the relationships between communication and components of energy conservation (salience, knowledge, attitude , and behavior) within each group of respondents. Covariates used for multiple classification analysis and partial correlation were education, income, family size, age of the house, and (in 1982 and 1983) sensitization. Hierarchical multiple regression was used to test the relationships of the control variables and age (as a continuous variable) to the heat factor. Since income has been found to be an important confounding variable in past studies of age-related differences in energy attitudes and behavior (Farhar et al., 1979), it is particularly important to control its influence. The Statistical Package for the Social Science (SPSS-X) was used to perform the analyses.

RESULTS

The first research question asked what differences would be found in the energy conservation behavior of younger as compared to older respondents.

In regard to H1, that younger respondents would adopt energy conservation behaviors at a faster rate than the older, hierarchical multiple regression analyses of heat factor data on the control variables and age as a continuous variable (Table 1) inicate that the older the respondent the more energy was used for heat. The relationship of the heat factor with age seems to strengthen over time, with a partial beta of .17 ($p<.05$) in 1981, .21 ($p<.01$) in 1982, and .35 ($p<.001$) in 1983. The analyses also indicate both income and family size as increasingly associated with the amount of energy used for heat over these years.

Analysis of self-report measures (Table 2) appears to confirm that older respondents do keep their home eating thermostats set higher than younger respondents across all three years of the study. A "behavior gap" also developed over the years of the study, in that younger respondents adopted actions to save energy in the home at a faster rate than did the older respondents, who were significantly behind the younger respondents by the third year. Younger respondents were also significantly more likely than older respondents to plan further conservation activities. These patterns are consistent with support of H1.

Constraints on behavior for both groups are reflected in the patterns of self-reported reduction in energy use for the previous two years, along with respondents' perceptions of the extent to which reductions could be made in home heat and hot water usage (measured in 1981 and 1982 only). In 1981, older respondents saw less latitude for cutback in their home heating and hot water usage than did younger respondents, and reported proportionately less cutback in energy use during the previous two years. By 1982, the differences between the two groups in their perceptions of latitude for further cutbacks diminished, likely to to actions already taken by the younger group. By 1983, the differences between groups in self-reported reduction in energy use was no longer statistically significant (even though younger responents were using less energy for heat than the older).

While there were statistically significant differences in energy conservation attitudes between the two groups in 1981, with the younger group more favorably disposed toward energy conservation than the older group, these differences disappeared in 1982 and 1983. The older respondents appear to have adopted attitudes more favorably oriented to conservation in the later years of the study, becoming more on a par with the younger group, despite the behavioral constraints the older group appear to face.

The second research question asked what differences would be found in energy salience and in energy information holding, needs and interests between younger and older respondents.

Table 3 indicates that, as expected, both groups are equal in the importance they give the energy problem, and are equally knowledgeable in Public Affairs Energy Knowledge. There is, however, no support for H2a, since both groups are equivalent in Practical Energy Knowledge. There is, however, support for H2b. In each of the three years of the study, the younger group perceived much more of a need for energy information for themselves, as compared to the older group. In both 1982 and 1983, older respondents were less interested than the younger in the specific types of information suggested: what others do to save energy in the home; one's own energy usage as compared to others; one's present usage as compared to the previous year; and the amount of money energy conservation measures save.

The third research question asked what differences would be found between older and younger respondents in their use of public affairs and energy communication media.

H3a is supported to the extent that older respondents spent more time with newspapers than did the younger in all three years. Use of the mass media was about equal otherwise, and there was not the hypothesized difference between groups in use of interpersonal communication regarding public affairs (Table 4).

H3b is supported only to the extent that, by 1983, older respondents generally began to discuss home energy use with persons outside the home less frequently than did the younger respondents (Table 5). Otherwise, there was no difference in the use of mass media for energy information, or in the use of other energy communication media. The proportion of each group having utility-sponsored energy audits grew equally and consistently from 1981 to 1983.

The fourth research question asked which media appear to relate to adoption of energy conservation behavior, especially among the elderly.

Table 6 indicates that relationships between mass media use and energy conservation behavior appear rather infrequently and sporadically across the years of the study. Table 7 indicates, however, that some of the media devoted more exclusively to energy information--especially means of communication used by the utilities (e.g., bill-insert pamphlets and home energy audits in particular)--bore stronger and more consistent relationships with the number of energy conservation activities engaged in by the older respondents than did even newspaper and television energy information. Thus, H5a is supported. Audits related positively to conservation actions taken by the older respondents in 1981 and 1983, and correlated with lowered thermostat settings among older respondents in 1981 (the only communication variable to be positively associated with this measure in the older age group). Thus, there appears to be some support for H5b, at least in two of the three years. Audits, however, bear a slight but statistically significant negative relationship with actions the younger group took to save energy in 1981. Older respondents who saw television energy commercials in 1981, and who read newspaper energy stories that year, also took more measures to save energy in 1981.

Energy communication media show more relationships with lowered thermostat settings among the younger respondents than among the older, perhaps reflecting the constraints on lowering the thermostat that elderly seem to face. Interpersonal communication about energy relates to conservation behavior only among the younger group, bearing a slight but significant relationship with total actions in 1982 and lowered thermostats in 1983.

In regard to energy information seeking, information requests correlate with actions taken to save energy for the olde group in 1981, and for both groups in 1982--the year in which other energy communication media seem to have the fewest relationships with either measure of energy conservation behavior. Requests also correlate in 1983 with lowered thermostat settings among the younger group.

The fifth research question asked which media appear to relate to conservation attitudes, salience, and knowledge among younger and older respondents.

Table 6 indicates that there are relatively few significant relationships between the more general media variables and energy conservation attitudes, with all five of the positive relationships occurring in regard to use of public affairs media (including interpersonal communication) among the younger respondents. Table 7 indicates that energy communication media bear much more of a profusion of relationships with energy conservation attitudes for both age groups, but especially for the younger. Processing of newspaper and television energy information is continuously related to conservation attitudes for younger respondents over all three years. Energy commercials relate positively to attitudes among the older group in 1982 and 1983, but negatively to attitudes among the younger group in 1983.

Among the older respondents, audits correlate with conservation attitudes in two of the three years (1981 and 1983). Among energy communication media, utility audits bear the most consistent relationships across attitudes and behavior measures, especially in 1983 for all respondents, and across years for older respondents.

In regard to H5a, Table 8 indicates that, within the older group, increased newspaper exposure does relate significantly to higher levels of Public Affairs Energy Knowledge in all three years. Among the younger respondents, this exposure time correlates with Public Affairs Energy Knowledge in one

year--1983. Among the older respondents, only the reading of public affairs information (in 1981) and television exposure (in 1983) relate to this form of knowledge--the latter a negative relationship.

Energy communication media (Table 9) bear much stronger and more consistent relationships with Public Affairs Energy Knowledge, notably among the older respondents. Among this group, Publ. Affairs Energy Knowledge does correlate positively with processing of newspaper energy information in 1981 and 1982. Thus, H5a gets at least partial support. Notably, two information seeking variables--audits and infrared analyses--also relate consistently to Public Affairs Energy Knowledge among the older group.

Communication relationships with Practical Energy Knowledge (Tables 8 and 9) are generally sparse, occur more commonly among the younger group, and are (with two exceptions) negative--a rather surprising result. Table 9 indicates that, even among the media more directly related to energy communication, negative relationships occur in 1982 between Practical Energy Knowledge and the younger respondents' processing of newspaper energy information and viewing of television commercials. A positive relationship is found for the younger group between specific requests for energy information and Practical Energy Knowledge. Both of these relationships disappear the next year. None of the communication variables related to Practical Energy Knowledge among the older respondents.

In regard to H5b, some of the strongest and most consistent communication relationships are found in regard to the salience of the energy problem. Thirteen of the correlations between the more general media use variables and salience (Table 8) are statistically significant, 12 in the positive direction. Most are found among the younger respondents, most consistently in the positive relationships between salience and using public affairs content in newspapers and on television. These variables related to salience among the older re-

spondents in 1981 as well. Among older respondents, reading of public affairs magazines related negatively to salience in 1982, but positively in 1983. (Reading of these magazines was also related negatively to conservation attitudes among older respondents in 1982.) Table 9 indicates that the most consistent relationships overall between media use and salience, and perhaps between media use and any of the components of energy conservation examined, exist in the partial correlations between salience and processing of newspaper and television energy information. Moderate to strong relationships are found consistently for both groups across all three years. Interpersonal communication about energy and reading of utility bill-insert pamphlets also show consistent relationships with salience across all three years for the younger group. For the older group, salience relates to pamphlet reading in 1981 and to interpersonal communication about energy in 1981 and 1982. Having a utility audit correlates with salience for the younger group in 1982. Thus, H5b is supported.

DISCUSSION

Constraints on the adoption of energy conservation behavior were apparent in this study, in particular for the older respondents. They consistently kept their home heating thermostats set higher than did the younger respondents, had fewer plans for future conservation measures, and in general adopted measures to conserve energy at a slower rate than did the younger group, producing an age-related "gap" in energy conservation behavior. These differences were reflected in the stronger relationship of age to the heat factor in the two later years of the study.

Desires to conserve, as reflected in conservation attitudes, do not seem to account directly for these differences.[3] If anything, attitudinal gaps closed over time, such that both younger and older groups were equally favorable toward energy conservation. Similarly, there were no developing differences in awareness (as measured by salience, Practical Energy Knowledge, and Public Affairs Energy Knowledge) that parallel the gap. It is very likely a "ceiling" to cutbacks--real or imagined--would eventually affect even the younger group, since over time they too perceived that they were nearing the point at which no more could be done. Younger respondents likely were exhausting what had been a larger potential for cutbacks, while the older group may have been living with less latitude for reduction to begin with.

Although both groups were equivalent in the two forms of energy knowledge, younger respondents were more likely to perceive that they needed more information about saving energy in the home, and consistently reported more interest in various types of energy information: how much energy they are using as compared to the previous year, how much money energy conservation measures save, how much energy they are using as compared to other homes like theirs, and what other people in similar homes are doing to save energy. These patterns suggest that those who perceive that they will still be able to use energy information of this type are more likely to perceive a need for it and exhibit an interest in it. Given the greater adoption of conservation actions by the younger group, it is also possible that that their interest in the four suggested types of information could also be fueled by a desire for feedback or reinforcement concerning the effects of the actions they have taken.

Age differences in media use were only partially apparent in the analysis. While the elderly spent more time with newspapers than did the younger group, as expected, use of other mass media and of interpersonal communication to discuss current events was equivalent. Processing of television and newspaper

energy information was equal for the two groups. In only one year was there evidence that elderly rely on interpersonal communication about energy less than do the younger group.

Use of energy communications media was, otherwise, equivalent for the two groups. Notably, use of utility-sponsored home energy audits grew equivalently across age groups, such that by 1983 nearly half (44-45%) of each group had availed themselves of such an audit.

Given the apparent constraints on behavior among the older respondents, which media appear to yield the strongest relationships with adoption of energy conservation behavior by that group? Media and messages devoted more exclusively to energy information, especially two means of communication used by the utilities (bill-insert pamphlets and home energy audits), as well as specific requests for information, bore the most consistent (two of three years) significant relationships with energy conservation activities engaged in by the older respondents. Having an audit was the only factor that correlated with lowered thermostat settings, albeit for only one year, among the older respondents, who may have subsequently decided it better to abandon this measure.

It is noteworthy that two of the information seeking measures (audits and requests) bore these relationships, since the patterns indicate the importance of customized information to the older respondents in particular. The relationship of the more general energy information in newspapers and energy commercials to the adoption of energy behavior by older respondents did not extend past 1981, indicating that its usefulness may have become exhausted. Information requests, however, related to behavior through 1982 and the relationship of audits (and pamphlets) to behaviors undertaken to save energy re-emerged in 1983. All of the significant positive relationships of information-seeking measures and energy-related discussions with energy behavior for the younger respondents also occurred in the two later years of the study,

although newspaper and television content (including commercials) also showed some correlation in the later years for that group. Thus both groups seem to have begun to use information more specific to their dwellings and lifestyles over time. The constraints on the older respondents, demonstrated in part by the few communication relationships with lowered thermostats in that group as compared to the younger group, may have motivated them to use the more customized information somewhat earlier than the younger group. By the last year of the study, audits bore the most consistent relationships with pro-conservation attitudes and behavior for both groups. This may reflect the strength of the role of the energy auditor as a change agent across groups.

While the more general types of media content, as well as energy content in newspapers and on television, bore relatively little relationship with behavior, they bore stronger relationships across years and age groups with attitudes and especially energy issue salience. The reading of newspaper energy stories and viewing of energy-related television programs in particular were related strongly to the perceived importance of the energy problem in all three years. Use of these media was also related almost as strongly with attitudes favoring energy conservation, although less so among the older respondents. Newspaper exposure and use of energy conservation media were more consistently related to knowledge of the public affairs aspects of energy among the older respondents, however. Thus, these media may affect processes related to awareness of the importance of energy conservation efforts, and possibly pro-conservation attitudes, even if they bear relatively little relationship directly to behavior.

Overall, it appears that the more energy-related the content and the more specifically applicable it is to the circumstances of the individual home, the more likely the information could influence behavior. The more general the content, the more likely that its influence would be limited to a less

constrained (and therefore more easily changeable) variable such as salience.

This analysis also revealed some apparent inconsistencies that can be grist for further research. The occasional negative relationships found between media use and the various components of energy conservation suggest the need for some examination of specific content and the need for some further assessment of media use motivations. In 1981, for example, younger respondents who had audits were more likely those of that age group who had performed fewer actions to save energy, while older respondents who had audits were more likely those of that age group who took more actions. While this pattern may reflect the older respondents' earlier need for implementing customized diagnoses, it may also reflect different functions performed by the audits for different groups of homeowners. Younger respondents may have been seeking a diagnosis before undertaking actions, while the older were seeking diagnosis as well as reinforcement for actions already taken. Reinforcement motivations may have become more prevalent in the younger group by 1983, given the growth of conservation activities among those respondents. Further research could investigate such possibilities.[4]

Negative relationships between Practical Energy Knowledge and some media may, upon further investigation, reveal patterns of media used by those with a deficit of this type of knowledge who are attempting to fill initial informational needs. The paucity of associations between media use and this type of knowledge, especially among the older group, may indicate that much of this knowledge is based in experience. Where experience is lacking, information requests may become a more essential means of gaining this knowledge, thus resulting in the positive association between Practical Energy Knowledge and requests among younger respondents.

Analysis of the heat factor data also indicated that, somewhat unexpectedly, higher income was associated with higher (not lower) levels of heat used per degree day of outside temperature. Perhaps the more well-to-do in this community, which has a large contingent of blue-collar workers, have decided to opt for consumption since they can "afford it." Larger families also became increasingly associated with higher heat factors over time. Perhaps it is increasingly difficult to co-ordinate the energy conservation habits or desires of individuals in larger families as energy conservation becomes less pressing.

CONCLUSION

This study suggests that energy-related content in the mass media bears stronger relationships with the perceived importance of the energy problem and energy conservation attitudes than with energy conservation behavior. The latter is associated more strongly with information requests, utility pamphlet reading, and utility audits, which may provide more specific and customized information necessary for implementation of energy conservation measures.

The analysis suggests an important role for the utility energy auditor as a change agent in adoption of energy conservation activities. This role may be particularly important in the highly segmented consumer energy market, in which general advice can be taken only at great risk of failure and adoption may require expert help in diagnosing the actions that are appropriate to one's dwelling and lifestyle. The relationships between information requests and adoption of energy conserving behaviors, as well as the patterns of relationships found between energy media and adoptions in later years of the study, indicate the importance of obtaining customized information that can be applied to one's own circumstances.

The role of the mass media in affecting the salience of the energy problem may be particularly important to study in the 1980s. Energy, which the public had consistently perceived as one of the most important problems facing the country in Gallup Opinion Polls taken since 1973, lost salience markedly just after the start of this decade (Gallup, 1972-1985). While energy use in the United States had generally been declining from 1979 through 1982, the trend has reversed since then, with the country increasingly using more energy each year for transportation, residential and commercial uses, with the total energy used for residential and commercial use in 1985 higher than even a previous peak in 1979 (U.S. Department of Energy, 1985). In addition, the country's reliance on imported oil is increasing (Oil and Gas Journal, 1986). Such patterns suggest that the role of communication in encouraging and maintaining energy conserving behavior remains an important concern.

NOTES

1. Kent and Rush (1976) found in a study of the elderly that exposure to print media was associated with higher levels of public affairs knowledge, while exposure to electronic media was not.

2. The local electric utility has also agreed to provide information for the study.

3. A higher level of Practical Energy Knowledge has been found to be a contingent condition for stronger attitude-behavior correspondence (Griffin, 1985).

4. Some evidence of a reinforcement function may have been found by Hirst (1981), who found that those who have audits are more likely than those not having audits to have taken some actions to save energy prior to the time of the audit.

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Table 1
Multiple Regression of Heat Factor on Demographic Variables
1981-1983

	Partial beta of heat factor with variable for survey year:		
	1981	1982	1983
Variable:			
Sensitization		-.04	.10
Age of Dwelling	.12	.08	.05
Number of Inhabitants	.11	.13	.25**
Education	.07	-.04	-.01
Income	.17*	.26***	.31***
Age	.17*	.21**	.35***
Multiple R	.25	.29**	.41***
n=	154	238	212

Significance: * p<.05
** p<.01
*** p<.001

Heat Factor is a measure of the amount of (gas) energy used to heat a home per degree day of outside temperature. The formula is:

$$\text{Heat Factor} = \frac{\text{Natural Gas Used (in therms)} - \text{Base Load}}{\text{Degree Days in Time Period}}$$

Where the Base Load is the amount of gas energy used for non-heating purposes (e.g., gas water heater, gas dryer) as estimated from summer gas usage.

Multiple regression analysis above is hierarchical, with sensitization entered first in 1982 and 1983. The block of variables (age of house, number of inhabitants, education, income) was entered prior to age (as continuous variable).

Table 2
Relationship of Age to Components of Energy Conservation Behavior
1981-1983

Variable	Year	Raw Scores: Under 65	Raw Scores: 65 Plus	Standardized & Adjusted *: Under 65	Standardized & Adjusted *: 65 Plus	Sig.
Lowered Thermostat Setting	81	65.6	67.3	.57	-1.67	.000
	82	65.4	67.4	.50	-1.42	.000
	83	65.6	67.6	.51	-1.59	.000
Energy Conserving Behaviors	81	1.0	0.7	.03	-.08	ns
	82	3.5	2.4	.14	-.40	ns
	83	4.9	3.4	.27	-.84	.002
Conserving Behaviors Planned	81	0.5	0.2	.07	-.21	.000
	82	0.5	0.2	.05	-.15	.002
	83	0.5	0.2	.05	-.17	.001
Pcvd. Amt. R Can Cut Heat	81	2.5	2.1	.11	-.31	.002
	82	2.3	2.0	.04	-.12	ns
	83					
Pcvd. Amt. R Can Cut Hot Water	81	2.5	2.1	.09	-.27	.02
	82	2.2	2.0	.05	-.14	ns
	83					
Reduction in Use Past 2 Yrs.	81	3.3	2.7	.15	-.47	.002
	82	2.9	2.6	.10	-.32	.02
	83	2.9	2.5	.06	-.20	ns
Energy Conservat'n Attitudes	81	3.6	3.3	.06	-.18	.008
	82	3.8	3.7	.02	-.06	ns
	83	3.9	3.7	.02	-.06	ns

* Significance and adjusted standard scores based on Multiple Classification Analysis with control for education, income, age of house, number of inhabitants (family size) and sensitization in 1982 and 1983.

		Under 65	65 Plus	Age Unknown	Total
N	1981	232	80	39	351
	1982	295	103	10	408
	1983	313	101	11	425

Table 3
Relationship of Age to Energy Issue Salience, Knowledge, Information Needs and Interests
1981-1983

Variable	Year	Raw Scores: Under 65	Raw Scores: 65 Plus	Standardized & Adjusted *: Under 65	Standardized & Adjusted *: 65 Plus	Sig.
Energy	81	3.4	3.2	.04	-.13	ns
Issue	82a	2.8	2.7	.02	-.06	ns
Salience	83a	2.8	2.8	-.01	.03	ns
Pub. Aff.	81	3.7	3.2	.04	-.13	ns
Energy	82	5.0	4.3	.07	-.20	ns
Knowledge	83	5.1	4.2	.10	-.31	ns
Practical	81					
Energy	82	4.6	4.2	-.01	.02	ns
Knowledge	83	4.2	4.4	-.09	.30	ns
Pcvd. Need	81	0.3	0.2	.04	-.11	.05
for Energy	82	0.4	0.2	.04	-.13	.01
Information	83b	0.9	0.7	.04	-.13	.000
Interest in	81					
What Others	82	2.3	1.9	.10	-.28	.000
Do to Save	83	2.2	1.9	.06	-.19	.02
Interest in	81					
Use Comp'd	82	2.4	1.8	.13	-.38	.000
to Others	83	2.4	1.9	.10	-.32	.000
Interest in	81					
Use Comp'd	82	2.5	2.1	.09	-.26	.000
to Last Yr.	83	2.5	2.0	.10	-.32	.000
Interest in	81					
Money	82	2.4	2.1	.09	-.25	.000
Saved	83	2.4	2.1	.08	-.25	.001

* Significance and adjusted standard scores based on Multiple Classification Analysis with control for education, income, age of house, number of inhabitants (family size) and sensitization in 1982 and 1983.
a. Change in calibration of scale after 1981.
b. Change in calibration of scale in 1983.

		Under 65	65 Plus	Age Unknown	Total
N	1981	232	80	39	351
	1982	295	103	10	408
	1983	313	101	11	425

Table 4
Relationship of Age to Media Use
1981-1983

Variable	Year	Raw Scores: Under 65	Raw Scores: 65 Plus	Standardized & Adjusted *: Under 65	Standardized & Adjusted *: 65 Plus	Sig.
Newspaper	81	-.18	.66	-.17	.49	.003
Exposure	82	-.21	.57	-.12	.35	.02
	83	-.10	.46	-.12	.39	.01
Television	81	-.01	.33	.09	-.03	ns
Exposure	82	-.21	.43	-.06	.17	ns
	83	-.16	.50	-.09	.28	ns
Pub. Aff.	81	3.2	3.4	-.04	.13	ns
Newspaper	82	3.4	3.5	-.02	.05	ns
Reading	83	3.4	3.4	-.01	.05	ns
Pub. Aff.	81	3.5	3.5	-.03	.08	ns
Television	82	3.4	3.6	-.04	.12	ns
Viewing	83	3.5	3.6	-.03	.10	ns
Pub. Aff.	81	.57	.44	.00	.00	ns
Magazine	82	.44	.28	.00	.00	ns
Reading	83	.47	.24	.03	-.11	ns
Pub. Aff.	81	2.8	2.7	.02	-.06	ns
Interper-	82	2.3	2.2	.03	-.09	ns
pers. Comm.	83	2.3	2.2	.01	-.02	ns

* Significance and adjusted standard scores based on Multiple Classification Analysis with control for education, income, age of house, number of inhabitants (family size) and sensitization in 1982 and 1983.

		Under 65	65 Plus	Age Unknown	Total
N	1981	232	80	39	351
	1982	295	103	10	408
	1983	313	101	11	425

Table 5
Relationship of Age to Energy Communication Variables
1981-1983

Variable	Year	Raw Scores Under 65	Raw Scores 65 Plus	Standardized & Adjusted * Under 65	Standardized & Adjusted * 65 Plus	Sig.
Newspaper	81	3.0	2.8	.05	-.15	ns
Energy Inf.	82	3.0	2.9	.02	-.07	ns
Processing	83	3.0	2.8	.01	-.03	ns
Television	81	2.9	2.6	.05	-.16	ns
Energy Inf.	82	2.8	2.7	.02	-.07	ns
Processing	83	2.9	2.7	.04	-.12	ns
TV Energy	81	.40	.48	-.01	.04	ns
Commercial	82	.46	.44	-.02	.05	ns
Viewing	83	.50	.49	.00	.01	ns
Bill Insert	81	3.0	3.2	.00	.01	ns
Pamphlet	82	3.2	3.4	-.04	.13	ns
Reading	83	3.2	3.4	-.05	.15	ns
Had Utility	81	.26	.24	-.01	.04	ns
Energy	82	.39	.33	.00	.01	ns
Audit	83	.45	.44	-.01	.02	ns
Energy	81	.35	.21	.02	-.06	ns
Information	82	.50	.35	.01	-.03	ns
Requests	83	.44	.35	.01	-.03	ns
Infrared	81					
Reading	82	1.4	1.4	.02	-.04	ns
	83	1.5	1.4	-.01	.02	ns
Energy	81	3.0	2.8	.05	-.14	ns
Interper-	82	2.8	2.7	.02	-.06	ns
sonal Comm.	83	2.9	2.5	.06	-.18	.04

* Significance and adjusted standard scores based on Multiple Classification Analysis with control for education, income, age of house, number of inhabitants (family size) and sensitization in 1982 and 1983.

		Under 65	65 Plus	Age Unknown	Total
N	1981	232	80	39	351
	1982	295	103	10	408
	1983	313	101	11	425

Table 6
Partial Correlation of Media Use Variables
with Energy Conservation Attitudes and Energy Behavior
for Under 65 and 65 Plus Age Groups

Variable	Year	Energy Conservation Attitudes: Under 65	Energy Conservation Attitudes: 65 Plus	Energy Behavior: Lowered Therm.: Under 65	Energy Behavior: Lowered Therm.: 65 Plus	Energy Behavior: Actions: Under 65	Energy Behavior: Actions: 65 Plus
Newspaper Exposure	81	.00	.10	-.02	-.19	.17**	.07
	82	.00	.02	.02	-.10	.04	.02
	83	-.04	-.09	.01	-.03	.02	-.04
Television Exposure	81	-.09	-.15	-.11*	-.001	.01	-.05
	82	-.02	-.05	-.08	-.10	-.01	-.16
	83	-.09	-.11	-.09	-.16	.03	.09
Pub. Aff. Newspaper Reading	81	.10	.12	.07	-.11	.06	.19
	82	.08	.06	.04	.09	.08	.01
	83	.10*	-.06	.01	.02	.12*	-.06
Pub. Aff. Television Viewing	81	.08	.09	.04	.06	-.02	.13
	82	.14**	-.02	.05	.06	-.02	.00
	83	.05	.04	.01	-.01	.10*	-.17
Pub. Aff. Magazine Reading	81	.23***	-.08	.12*	.16	-.01	.04
	82	.05	-.19*	.08	-.08	.09	-.03
	83	.10*	.06	.05	.01	.06	-.06
Pub. Aff. Interpersonal Comm.	81	.05	.00	-.02	-.04	.02	.05
	82	-.06	.02	-.03	-.06	.05	.07
	83	.11*	.03	.06	.16	.02	-.02

Partial correlations controlled by education, income, age of house, number of inhabitants (family size) and sensitization in 1982 and 1983.

		Under 65	65 Plus	Age Unknown	Total
N	1981	232	80	39	351
	1982	295	103	10	408
	1983	313	101	11	425

Signif.: * .05
** .01
*** .001

Table 7
Partial Correlation of Energy Communication Variables with Energy Conservation Attitudes and Energy Behavior for Under 65 and 65 Plus Age Groups

		Energy Conservation Attitudes		Energy Behavior			
				Lowered Therm.		Actions	
Variable	Year	Under 65	65 Plus	Under 65	65 Plus	Under 65	65 Plus
Nsp. Energy Information Processing	81	.14*	.12	.12*	.12	.09	.28**
	82	.14**	.22*	.04	.11	.06	.13
	83	.16**	.14	.11*	.10	.06	.13
TV Energy Information Processing	81	.19**	.25*	.10	.04	.11	.14
	82	.23***	.07	.10	.12	.07	.11
	83	.25***	.33***	.14**	.08	.11	.12
TV Energy Commercial Viewing	81	.00	.19	.07	.05	.01	.40***
	82	-.06	.23*	.10*	.16	.03	.01
	83	-.11*	.19*	-.04	-.04	.00	.06
Bill Insert Pamphlet Reading	81	.12*	-.03	-.01	.15	.10	.22*
	82	.13*	-.08	.03	-.07	.04	.05
	83	.08	.17	.05	.05	.06	.20*
Had Utilty Energy Audit	81	.09	.20*	.01	.22*	-.14*	.37***
	82	.02	.02	.07	.11	.08	.12
	83	.13*	.24*	.15**	.15	.21***	.26**
Energy Information Requests	81	.14*	.17	.10	.12	.00	.36**
	82	.06	.04	.00	.14	.21***	.22*
	83	.10*	.07	.11*	.10	.07	-.03
Infrared Reading	81						
	82	.02	-.01	-.02	.12	.01	.00
	83	.11*	-.05	.10	.09	.05	.16
Energy Interper- sonal Comm.	81	.10	.27*	.07	.01	.06	.19
	82	.15**	.04	.03	.10	.12*	.10
	83	.07	.04	.13**	.04	.07	.12

Partial correlations controlled by education, income, age of house, number of inhabitants (family size) and sensitization in 1982 and 1983.

		Under 65	65 Plus	Age Unknown	Total
N	1981	232	80	39	351
	1982	295	103	10	408
	1983	313	101	11	425

Signif.: * .05
** .01
*** .001

Table 8
Partial Correlation of Media Use
with Energy Issue Salience and Energy Knowledge
for Under 65 and 65 Plus Age Groups

		Energy Issue Salience		Energy Knowledge: Public Affairs		Energy Knowledge: Practical	
Variable	Year	Under 65	65 Plus	Under 65	65 Plus	Under 65	65 Plus
Newspaper Exposure	81	.19**	.15	.01	.31**		
	82	.13*	-.02	-.04	.22*	-.09	.00
	83	.03	.02	.12*	.18*	.13**	.06
Television Exposure	81	.13*	.07	-.06	-.08		
	82	.01	-.24	-.04	-.06	-.08	.02
	83	-.08	.09	.06	-.18*	-.13*	-.15
Weekly Newspaper Reading	81	-.01	.10	-.03	.13		
	82	-.04	.06	-.01	.05	.03	.00
	83	.09*	-.31**	-.11*	.10	-.01	.11
Pub. Aff. Newspaper Reading	81	.22***	.31**	.11	.20*		
	82	.21***	-.02	-.04	.08	-.11*	.02
	83	.02	.07	.07	.00	.05	-.03
Pub. Aff. Television Viewing	81	.18**	.26*	.05	.04		
	82	.29***	.08	.05	-.06	-.06	.06
	83	.12*	.15	.05	-.08	-.02	-.10
Pub. Aff. Magazine Reading	81	.04	.20	-.01	.04		
	82	-.01	-.19*	.09	.06	-.03	.03
	83	.01	.23*	-.03	-.08	.02	-.15
Pub. Aff. Interpersonal Comm.	81	-.03	-.05	-.08	-.03		
	82	.01	.06	.06	.01	-.03	-.24*
	83	.11*	.01	-.03	-.10	-.03	.10

Partial correlations controlled by education, income, age of house, number of inhabitants (family size) and sensitization in 1982 and 1983.

		Under 65	65 Plus	Age Unknown	Total
N	1981	232	80	39	351
	1982	295	103	10	408
	1983	313	101	11	425

Signif.: * .05
** .01
*** .001

Table 9
Partial Correlation of Energy Communication Variables with Energy Issue Salience and Energy Knowledge for Under 65 and 65 Plus Age Groups

Variable	Year	Energy Issue Salience		Energy Knowledge: Public Affairs		Energy Knowledge: Practical	
		Under 65	65 Plus	Under 65	65 Plus	Under 65	65 Plus
Nsp. Energy Information Processing	81	.28***	.38***	.02	.28**		
	82	.29***	.18*	.09	.33***	-.13*	-.04
	83	.29***	.25*	.07	.01	.08	.10
TV Energy Information Processing	81	.30***	.49***	.05	.19		
	82	.28***	.24***	.04	.23**	-.07	.07
	83	.24***	.34***	-.05	.07	-.04	-.02
TV Energy Commercial Viewing	81	-.13*	.19	.07	.24*		
	82	-.04	-.07	.02	.06	-.13*	.04
	83	-.06	.05	.14**	.09	-.04	-.06
Bill Insert Pamphlet Reading	81	.25***	.36***	-.04	.31**		
	82	.18***	-.14	.02	-.04	.01	-.10
	83	.16**	.07	.00	-.05	-.06	.01
Had Utility Energy Audit	81	.08	.20	-.04	.29**		
	82	.11*	-.02	-.09	.21*	.02	.00
	83	.09	-.05	-.03	.19*	.06	-.09
Energy Information Requests	81	.02	.01	-.01	.17		
	82	.06	.16	-.02	.11	.10*	.01
	83	.05	-.03	.04	.11	.05	.00
Infrared Reading	81						
	82	.06	-.07	-.03	.36***	.01	.00
	83	.08	-.16	-.03	.28**	.06	.00
Energy Interper-sonal Comm.	81	.16**	.25*	-.09	.10		
	82	.15**	.23*	.16**	.08	-.01	.01
	83	.22***	-.08	-.05	.02	.02	.10

Partial correlations controlled by education, income, age of house, number of inhabitants (family size) and sensitization in 1982 and 1983.

		Under 65	65 Plus	Age Unknown	Total
N	1981	232	80	39	351
	1982	295	103	10	408
	1983	313	101	11	425

Signif.: * .05 ** .01 *** .001