

NESTBUILDING AND HOUSEHOLD ENERGY PURCHASE DECISIONS

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Nestbuilding can best be described as an preoccupation with home improvement. In this paper we use ethnographic and survey data from California and Norway as a basis for discussing nestbuilding, its role in household energy purchase decisions and its potential use in energy conservation incentive programs. Research in both Northern California and Norway reveals a link between nestbuilding and household energy purchase decisions. Nestbuilders characteristically have a home-oriented lifestyle. The home is a central focus of free-time activity. Its lay-out, appearance and aesthetic impression are issues for constant discussion and review by family members. For those households which do energy conservation improvements (such as wall insulation, energy efficient windows and appliances, thermostat controls, solar panels, etc.) it is often because they are categorized by these families as home improvements. Energy purchases are often done in connection with a renovation or addition to the home. Though the prospect of saving energy or money is often seen as a secondary benefit, the primary motive is to improve the home's look or comfort. Energy conservation information campaigns and other incentive programs in Scandinavia and the United States could make better use of nestbuilding in motivating households to make energy conservation purchases.

WHAT MOTIVATES HOUSEHOLDS TO MAKE ENERGY CONSERVATION PURCHASES?

This is an important question both for social scientists interested in unraveling the complexities of human behavior and decision making, and for energy planners interested in stimulating energy conservation. When it comes to the household, behavior and purchase decisions are extremely complex. The home performs many functions; among other things, it is a haven from the outside world, it is the arena in which most household members spend at least 60% of their time, and it is a reflection of the household's taste and prosperity (Gullestad 1984). As such the material elements of which the house is constituted have many different values associated with them--they should be durable, attractive, functional, reasonably priced, and contribute to the home's ambiance and comfort.

Another dimension of complexity is that household decisions are collective decisions. Family members have their individual life experiences, attitudes and interests, which they parley through role playing, negotiation and scenario building. Bonfield, et al, (1984) reviewed the household decision making literature and concluded that researchers have focused too strongly on the consensus building aspects in household purchase decisions. By studying decision making behind purchases which have been made we have neglected important issues surrounding conflict avoidance and resolution. Park (1982) concluded that household decision making was a "muddling through process" in which neither party is ever completely certain of the other's strategies or wishes. As a result, actors seek to minimize conflict rather than maximize utility.

When it comes to energy purchases, the decision making process is further complicated by the fact that many of the attitudes and needs which are brought to bear have little or nothing to do with energy use *per se*, but rather with more general attitudes to the home (Van Raj and Verhallen 1983; Aronson and Yates 1983; Wilk and Wilhite 1985). Issues such as attitudes towards waste and conservation, concerns about energy costs and energy knowledge have an effect on the way households make energy decisions (Hildebrandt 1984; Brown and Macey 1983), but hypotheses which focus narrowly on energy variables will never yield a complete explanation of household energy use and decision making (Eden and Ordesson 1983; Nurmela and Tanskanen 1984; Hallin and Pettersson 1986).

In this paper we discuss a home-related phenomenon which we have called "nestbuilding." Nestbuilding has been shown to have a strong relationship to energy decision-making in home owning households in both Northern California and in Norway. We discuss the role of nestbuilding in household decision making, its relevance for energy purchase decisions and its implications for energy conservation incentive programs. The nestbuilding hypothesis is one of the issues which the authors will test in a current Nordic study of the relationship between feedback information and energy conservation decisions. We briefly discuss the study under "Current Research."

NESTBUILDING AND HOUSEHOLD ENERGY DECISION MAKING

Richard Wilk and Hal Wilhite started an ethnographic study of household energy decision making in Santa Cruz by asking the standard energy-oriented questions. We expected to develop hypotheses about the relationship between energy variables--such as concern about energy costs and prices, attitude to environment, knowledge about the house as an energy-using system--and energy decisions.¹ To our surprise, and initial consternation, we began to identify a pattern of behavior which was critical in energy decision making but which involved a number of non-energy factors. These behaviors had to do with making, adjusting and improving the home, an activity which

brought to mind the analogy of nestbuilding. (Wilk and Wilhite, 1983).

Nestbuilding is a preoccupation with the appearance, value and content of the home, which manifests itself in home improvement and home purchase activity. Nestbuilding leads to purchases and renovations directed at improving the home. We distinguish home improvement activity from home maintenance activity, which involves routine repairs (roof, window, appliance) and regular maintenance (furnace, gutter cleaning, chimney sweeping). Nestbuilding activity is usually shopping-intensive, as opposed to a labor-intensive activity. Nestbuilders are only marginally better at home repair than are the general population of home owners. On priority lists of things to do around the house, only urgent repairs tend to take priority over desirable home improvements. Part of the explanation for this is that much of repair and maintenance is labor-intensive and does not usually lead to visible or aesthetic improvement. Nestbuilding is an on-going activity which has periodic surges. Surges in nestbuilding activity can be associated with the life-cycle of the home and the family which occupies it.

A study in Oslo in 1984 revealed that nestbuilding was also related to energy purchase decisions made by home-owning Norwegians. In a study of residents who had made energy purchases with financial support from Oslo City Light's Energy Conservation Fund (participants received a small grant and a loan at an interest rate a couple of points below the market rate), we found that home improvement was a significant motive in home purchase decisions (Wilhite 1984).² Though the hypothesized

¹ We interviewed 30 households which had invested at least \$50 in energy conservation purchases and a matched sample of 30 households which had invested less than \$50. Interviews were supplemented by the use of energy diaries, in which participants kept track of the way they used the home and energy appliances.

² Personal interviews were done with twenty five households which had contacted Oslo City Light's energy auditors about support for an energy conservation purchase. Households in 3 categories were interviewed.

1. Those who had contacted the auditor, received an application form, but did not return it.

2. Those who returned the form, had the audit, but did not go through with the purchase.

3. Those who went through the entire process and made the purchase.

relationship between nestbuilding and energy conservation activity has not been tested in other Scandinavian studies, two Swedish studies of the early 80's pointed to a relationship between energy purchase decisions and home improvement (Fælt, Hansen and Holmlov 1982; Eden and Oredsson 1983).

Home Orientation

Nestbuilders are most often home-oriented nuclear families. One, or often both, adult members of the family tend to spend a lot of their free-time at home. They seek a comfortable, aesthetically pleasing home environment, in which warmth, colors, light, style and space play an important role. For many, improving and adjusting the home environment can take the form of a hobby or even an obsession. Interviews in both California and Norway revealed a strong correlation between home-orientation and nestbuilding. Those families who spend more free time in the house and whose hobbies and extracurricular activities are centered around the house, are much more likely to be nestbuilders than those whose free-time is spent away from home. Typical non-home free-time activities for the non-nestbuilders in the sample included sports, evening classes, films, and eating out.

Nestbuilding families often maintain a prioritized mental, or sometimes written list of home improvements, which they update and change as improvements are made or as priorities change. Families discuss these lists with varying frequency and intensity. Some families discuss it daily, others a few times a month. When the household enters the planning phase for a renovation or "fix-up", discussions usually become more intense.

The Home As a Symbol

The symbolic nature of the home is an important element of nestbuilding. The home has a strong symbolic value for both Norwegians and Americans. The home is a "castle", a refuge, and a symbol to the outside world of the household's prosperity and well-being. As Gullestad (1984:85) found in her study of family life in Bergen, Norway,

The home (hjemmet) is central as the family's territory and often also their most important economic asset. The ideal home is celebrated in "native theory" for its atmosphere of warmth, coziness, peace, quiet and safety as opposed to the colder, more challenging but also potentially more dangerous outside world. Considerable time and money are invested in it to secure those values symbolically.

Homeowners are especially concerned with the homes symbolic reflection of prosperity and well-being. The house for many homeowners is an outward reflection of a family's taste.

Several respondents in the Santa Cruz study went so far as to assign a kind of "personality" to the home, by which they meant its particular appearance, comfort and aesthetic feel. For these families, it was very important that a home purchase either conformed to, or made a positive change to this personality. Norwegian respondents never went so far as to use the word personality, but they were nonetheless very concerned about the home's aesthetic. In terms of Norwegian cognitive semantics, this is expressed in the term "koslighet" (coziness); it is very important for a Norwegian to "ha det koselig" (feel or experience coziness) and to demonstrate to guests that such is the case. This coziness also has a physical dimension important to energy-use - the home should be "godt og varmt" (good and warm).³ Two standard complements from a guest in a Norwegian home are that the house is cozy and that it is good and warm.

A Middle and Upper Class Phenomenon

Nestbuilders tend to allocate much of their disposable income to home improvement. In fact disposable income (or a willingness and opportunity to mortgage purchases) is a necessity for the manifestation of nestbuilding in the form of purchase

³ Note the cognitive association of "goodness" and "warmth" - a good house is a warm house. In our opinion this is one explanation for higher thermostat settings and room temperatures in Norwegian households. Average inside temperatures in studied households were 22 degrees celsius, compared to 20.5 degrees in the California sample.

activity. By contrast, low-income families studied in Watsonville, California, have displayed the elements of home orientation (i. e., pride in the home and the recognition of a desire to improve the home), but were financially stretched to meet basic needs and had little room for home improvement purchases (Wilhite, 1983). This result is supported in a recent study in Northern Norway (Guvåg and Buvik 1989).

ENERGY CONSERVATION INVESTMENTS

Motives and Stimulants

Nestbuilding has significance for the study of general household behavior and decision making, but also for the specific study of energy use in the home. The crucial point is that energy purchases sometimes get categorized by nestbuilding families as home improvements and thereby get moved onto purchase priority lists. Energy conservation items such as wall or ceiling insulation, double-pane windows, thermostat control for space heating, a jacket for the hot-water heater, a new energy efficient refrigerator whose color matches the new kitchen, etc., often slide onto the household's priority list. The reasons for this are many, but experience from the Norwegian and Californian studies is that energy economics play a minor role (this is supported by Mills (1989) in his study of appliance purchases in Sweden). Purchases in Santa Cruz and Oslo were not often motivated by an evaluation of the family's energy budget, energy expenditures or a desire to reduce them. Fewer than 10 percent of families in either study bothered to monitor their energy bills in the period following purchases to find out whether they had in fact reduced their consumption and expenditures.

Of those things responsible for an energy purchase moving onto and rising to the top of a home priority purchase list, the following were common to Oslo and Santa Cruz:

1. Discomfort, especially drafts. A typical pattern was that families would initially combat interior chilliness by generating more heat, either by raising thermostat settings on space heaters, turning on more electric panel heaters, or using

wood stoves or fireplaces to supplement primary heating. Drafts, however, are impervious to higher indoor temperatures. The inability to defeat them by turning up the heat resulted in a capitulation to the purchase of insulation, energy efficient windows, or less frequently, weatherstripping.

2. "Go-together" thinking. We found that if a new facade, roof or room is being added to the house, insulation or energy efficient windows are sometimes seen as a natural go-together.
3. Bargains. Getting something on sale was a powerful motivator for both middle-class Americans and Norwegians. When families were in the process of list-making and purchasing, subsidies, cheap loans and tax breaks were often the deciding factor in the energy purchase decision.

Barriers

In both the Santa Cruz and Oslo studies, we examined a sample of "non-investors" for the purpose of identifying barriers to energy conservation investments. We found several barriers to energy purchases which were common to both cities. The most important of these had to do with concerns about the attractiveness or aesthetic appeal of the purchase. Again, the preferred purchases, that is to say those which tend to work themselves to the top of priority lists, are those which are visible, attractive or add to the coziness of the house. Many energy conservation purchases, such as insulation and weatherstripping, were not prioritized because they were not considered to be visible additions to the coziness of the house.

Concerns about the health consequences of creating too-tight house were also issues in both Santa Cruz and Oslo. The primary concern was that retrofitted insulation or weatherstripping would create an unhealthy indoor climate. None of the respondents could say specifically which health consequence that they anticipated or feared other than to make a general comment about "bad air" or "stale air." This health barrier is noteworthy because for the housing stocks involved, retrofitted insulation is highly unlikely to inhibit the air-exchange to the extent that indoor air becomes unhealthy. Nørgård (1989)

contends that the most serious problems associated with bad indoor air can be attributed to poor ventilation systems and not to over-insulation.

Finally, for those who had investigated using the utility-sponsored incentive program in Oslo, where applicants to the program were required to provide extensive information on the house and its energy systems as a prerequisite to the auditor visiting the home, the paperwork and economic concepts and calculations involved in the transaction caused them to give up.

Environment and Self-sufficiency

The role of environmental concern as a factor in household energy decision-making is not as strong as one might think. Though families in both countries expressed varying degrees of environmental concern, only a few volunteered it as a reason for their energy purchase. In the case of solar panels and greenhouses purchased by Santa Cruz households, our impression from interviews was that people were more concerned about their contribution to the household's energy self-sufficiency than they were about their positive environmental impacts. Another issue here was status. It was clear that many of those who had invested in solar panels and greenhouses enjoyed the fact that they were a visible message to friends and neighbors of the cleverness and altruism of the household within. The absence of the environmental issue as a strong motive for energy conservation purchases suggests that when it comes to decisions concerning the home, home issues (comfort, aesthetics, budget) dominate.

The self-sufficiency motive for engaging in energy conservation constitutes the single clearest contrast between the Santa Cruz and Oslo studies. Energy self-sufficiency was a strong motive for Santa Cruz respondents, and behind it lay a skepticism to the electric utility. The majority of the households interviewed did not believe that the utility was operating in the best interests of its customers. Its choice of supply options was not seen to reflect customer preference and its financial strategy and pricing policy were seen to favor share holders as opposed to users. Some families saw that it was in their best interest to be independent of the utility.

Energy conservation for them was a step towards energy self-sufficiency and a step away from the utility.

This motive was entirely absent among respondents in the Oslo study, in spite of a conclusion by Gulestad (1984:85) that self-sufficiency is an important part of the ideology of the Norwegian household: "On the ideological level housing embodies the value of autonomy. Autonomy is very much a matter of being lord of one's castle. Autonomy of the household is highly valued and expressed in numerous proverbs. Autonomy means being self-reliant and independent." Evidently, Norwegians do not associate the self-sufficiency ideology with their energy use. One reason may be the faith that Norwegians have in their public institutions. Respondents in Oslo trusted the energy utility and were confident that it was operating in their best interests. This trust removes an important motive for energy self-sufficiency. Another issue is that energy is abundant and cheap (for a middle class family, energy costs represent only about 5% of total monthly expenses, as compared to 8 - 10% in Santa Cruz). Why reduce dependency on a system which is thought of as being capable of meeting needs at low cost?

CYCLES WHICH AFFECT NESTBUILDING ACTIVITY

Nestbuilding activity is on-going and cyclic. According to Gulestad (1984:93), "What is so striking . . . is how home decoration is not done once and forever but has become a constant ongoing concern." We have observed that the first surge of activity occurs in the first 1-2 years after the house is occupied. In this period, people have allocated money and are prepared to use their time on improvements and alterations to the home. Energy purchases are often made during this period. In California, the energy improvements most often made in this period were weatherstripping and insulation.

Other surges of activity are associated with the life cycle of the house and home appliances. The shorter cycles of exterior painting and roof maintenance, as well as the longer cycles of window changes and

insulation replacement, both can stimulate home energy improvement activity.

Finally, changes in family cycle can also stimulate nestbuilding and energy investments. The cycle of growth and diminishment of the family creates demands for renovations and modifications to the home. In Figure 1 we show how waves of activity correspond to changes in the family. The arrival of the first baby is particularly significant; families enter a period of reassessing the way the home accommodates the child. In this assessment, there are two major issues: space and health. In terms of space, children often stimulate the additions of new bedrooms or bathrooms. Cyclical improvements which are near the end of their life cycle, such as changing windows or new wall insulation, are often done at the same time. Families are very sensitive to creating a healthy environment for the child. Adults in our study described how they found themselves, perhaps for the first time since occupancy, crawling around on the floor checking for cold spots and drafts. The presence of drafts was often the factor which precipitated a household's decision to purchase weatherstripping, insulation or energy efficient windows.

Survey data from a random sample of Oslo households, which the authors have collected in conjunction with a study on Nordic Billing Information, support the contention that families expecting their first child enter a period of increased energy purchase activity. Figures 2 and 3 show, respectively, energy conservation purchases and major appliance purchases by stage in the family cycle. Figure 2 shows a marked increase in energy saving purchases for families with young children (less than three years old). Looking at figure 3, we see that appliance ownership peaks for families with pre-adolescent children. In figure 4, however, we have plotted the change in major appliance ownership from one stage in the family cycle to the next, which again shows the highest acquisition rate among families with young children.

Subsequent children also lead to reassessment followed by nestbuilding episodes, but these episodes tend to involve less activity than that associated with the first child. There is often a final

wave of activity when the last child moves away from home. At this point the parents who remain behind tend to remake the home to suit their needs. As is the case with parents with young children, older people are particularly aware of drafts and cold spots, so house-tightening is often done at this point. Another issue with older people is frugality. Older people tend to adapt a more frugal lifestyle, which may lead to a reassessment of their energy expenditures and an examination of means to reduce them. Figure 4 shows that older people often get rid of or do not replace their major energy appliances.

These family cycle variations in nestbuilding activity take us back to the symbolic nature of the home. For families rearing children, the home is a nest which will protect and nourish the child. When children have grown and moved away from home, it is no longer a nest, but rather a sanctuary of comfort, convenience and ease of operation for the aging adult(s) who remain.

APPLICATIONS IN ENERGY CONSERVATION PROGRAMS

Targeted programs

An important goal for energy conservation programs directed at home-owning families should be to take advantage of these cycles of renovation activity illustrated in figure 1. The occupancy wave lends itself to targeted programs, where new homeowners are identified and sent information on energy conservation possibilities and programs. The other waves are more difficult to target, but suggest themes for advertising; for example, emphasizing the advantages of energy conservation for families which are expecting or have young children, or for older people who are dismantling the nest.

General Advertising

The central theme in most Nordic advertising associated with energy conservation programs and incentives has been "saving energy saves money". As we have pointed out, money is not the only utility function which households are interested in maximizing; other things are important, among them comfort and aesthetics. We should take advantage of

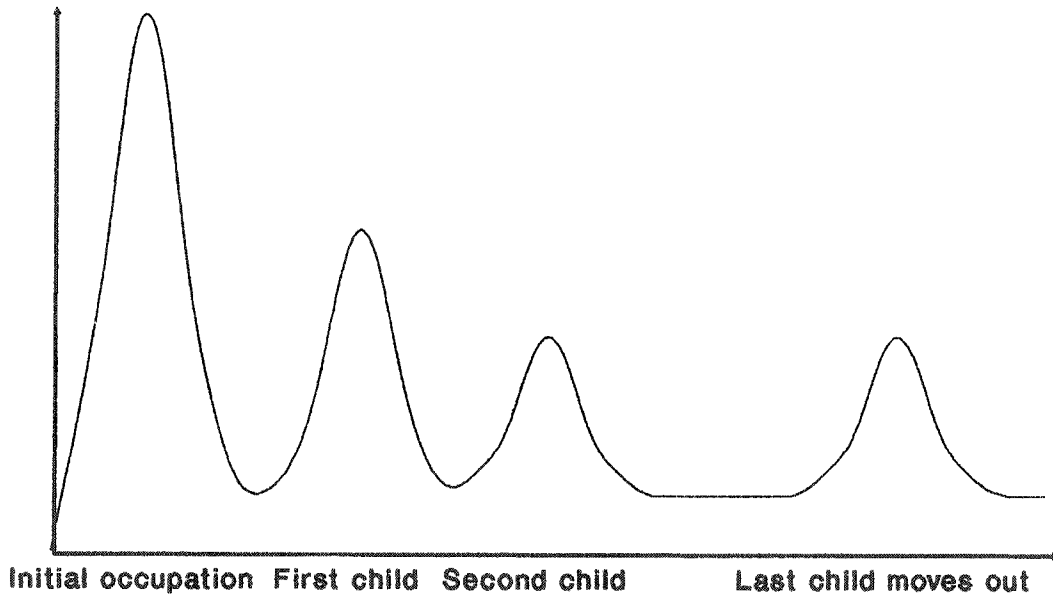


Figure 1. Waves of Energy Purchase Activity

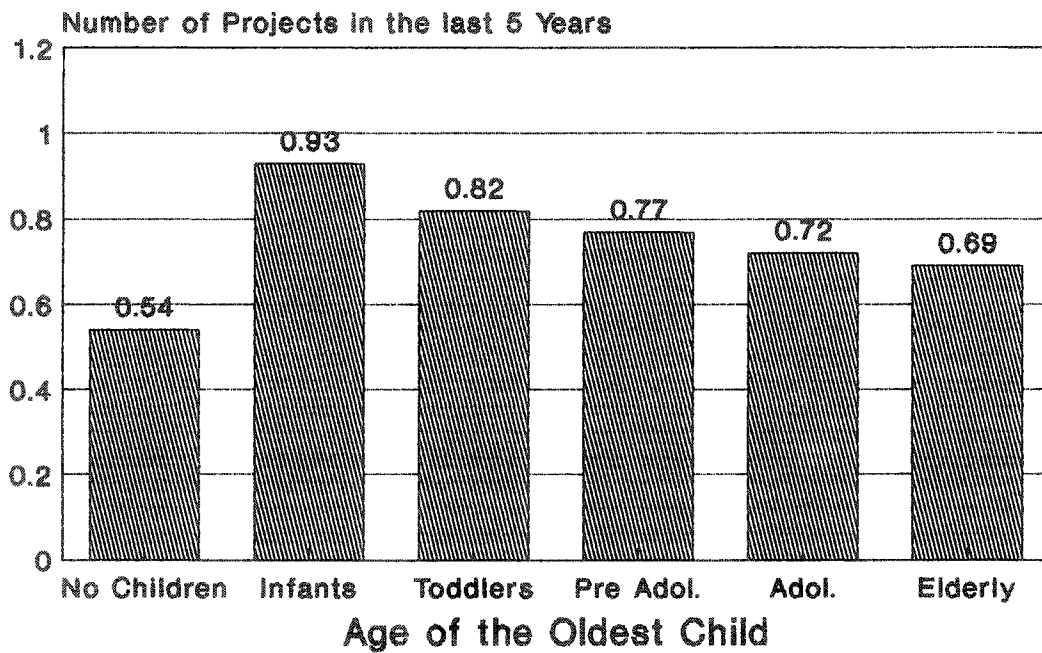


Figure 2. Energy Saving Projects by Family Structure

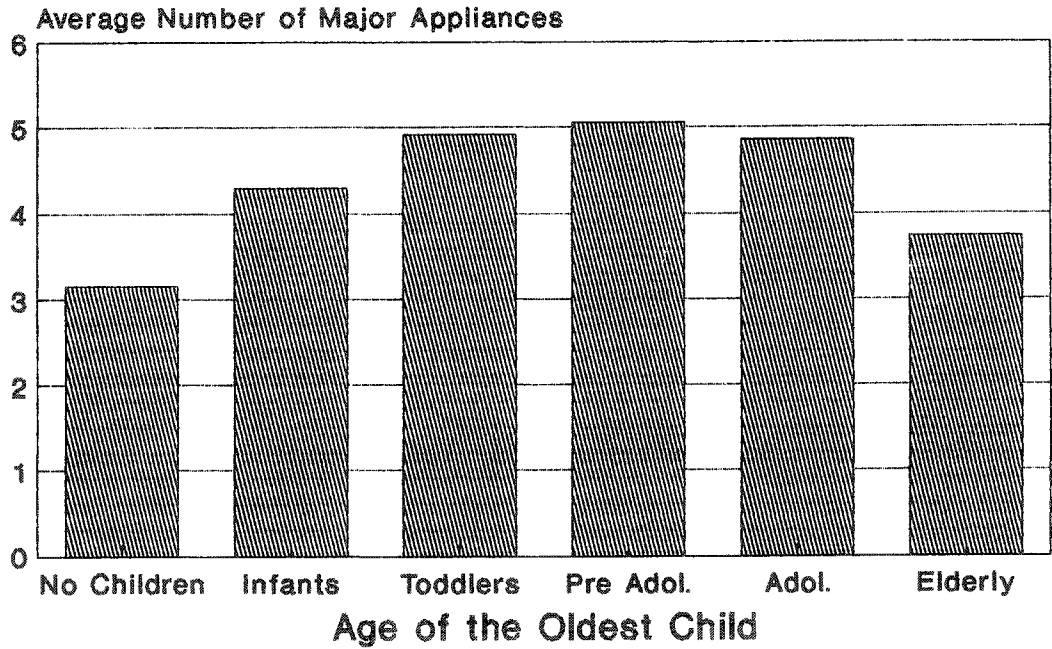


Figure 3. Average Number of Appliances by Family Structure

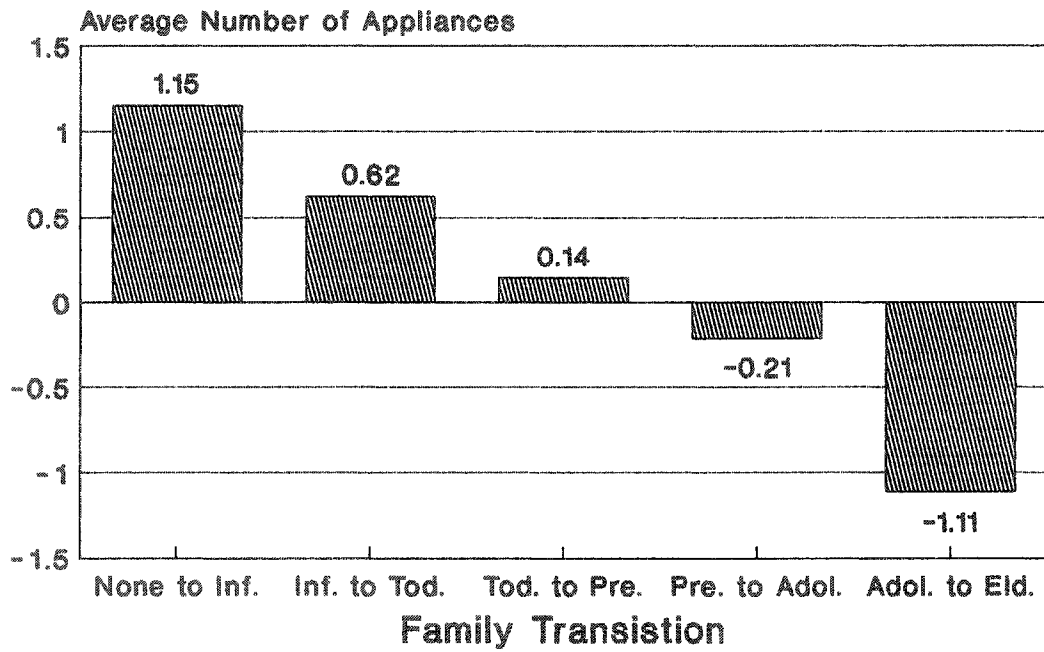


Figure 4. Changes in Appliance Holdings by Family Structure

this in the way we advertise energy conservation programs. The Oslo Electric Utility, Oslo City Light, and the Norwegian Federation of Energy Utilities (NEVF) have experimented with advertising which emphasizes aesthetics, comfort and home improvement. These campaigns have not been formally evaluated, but the subjective assessment of those who work with energy conservation programs is that these campaigns have had a positive effect. Both the Oslo Utility and NEVF have sponsored video programs emphasizing these aspects and Oslo City Light has given its energy auditors training on how to recognize nestbuilders and to motivate them to see energy conservation improvements as home improvements. Among other things, auditors have been encouraged to take pictures of energy retrofitted buildings with them on their audits. The pictures provide evidence to skeptical households that an energy retrofitted building can also be an attractive building.

CURRENT RESEARCH

In conjunction with a research project on billing information, we will be able to shed more light on nestbuilding and its energy-use manifestations. In the project we have taken a random sample of 1360 households in Oslo and a selected sample of 935 households in Helsinki. Households in both cities have been assigned to control and experimental groups. We have created a hierarchy with the experimental groups, so that if group n receives information i , group $n + 1$ receives information $i + j$. Differences in consumption between groups can be attributed to j . We will thus be able to associate a given information technique with an energy conservation potential.

Through processing responses from an initial questionnaire, we have an overview of essential characteristics of the households and their homes. At the end of the experiment we will do an exit questionnaire and personal interviews which will address issues associated with how households have adapted to the improved energy information environment. We will focus specifically on energy conservation activities; which energy conservation strategies do people choose and why do they choose

them? When it comes to purchases, we will be able to analyze purchases according to family cycle and house cycle, to come up with a preference or priority list of purchases and to assess which characteristics of purchases families emphasize in their decisions. In short, this project will give us the opportunity to test the nestbuilding hypothesis in a controlled environment. We will sharpen our knowledge of what nestbuilding is and how it affects energy decision making.

CONCLUSION

Nestbuilding is a preoccupation with the appearance, value and content of the home. We are convinced that nestbuilding, and related home improvement activity, plays an important role in the household energy purchase decisions of homeowning households. There is evidence that nestbuilding is a cross-cultural phenomenon and thus may have broad applications in energy conservation programs. The relationship between nestbuilding and energy purchases underscores an important point: we will not gain a full understanding of how and why families engage in energy conservation until we broaden the scope of our inquiries to the full range of household behaviors and lifestyles.

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