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Title: Consumer Attitudes Toward Potentially Restrictive Energy Conservation Regulations

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A sample of 893 Oregon individuals from a Western Regional Agricultural Experiment Station Project (W-159 "Consequences of Energy Conservation Policies for Western Region Households") was used to analyze consumer attitudes toward potentially restrictive energy conservation regulations. Belief in the seriousness of the energy problem, a psychological measure of internal control (internality), and eight socio-demographic characteristics were examined in relation to consumer attitudes toward these regulations.

Logistic regression was used to determine the probability that a respondent would oppose or favor seven different energy conservation regulations, not believe or believe in the seriousness of the energy problem, and have a low or high degree of internality, and what the related function of eight socio-demographic characteristics were. Log-linear analysis was used to obtain descriptions of the relationships among all the variables included in a high order contingency table.

The significant socio-demographic characteristics in the logistic regression analyses varied depending on the regulation, indicating that personal impact or inconvenience determined respondents' attitudes. The regulation with the greatest opposition and the greatest number of significant socio-demographic variables and interactions, was "discourage building homes away from towns and cities to lessen travel by car."

Those who did not believe in the seriousness of the energy problem were over 50 years of age, male, had less than a college degree, and opposed mandatory energy conservation regulations related to home thermostat settings. Homeowners opposed the regulation requiring their homes to pass an energy audit. Opposition to regulations appeared to be related only to an individual's perception of the consequences of the regulation, and not to belief in the energy problem or locus of control. Those with low internality scores included females, rural residents, respondents over 50, and those with less than a college degree. Social exchange theory is proposed as an explanation of beliefs, attitudes and practices related to energy conservation.

An expert Delphi Panel ranked the energy conservation regulations on degree of restrictiveness. The Kendall Tau Coefficient tested for associations between the Delphi Panel ranking of the regulations and respondents' perceptions of the restrictiveness of the regulations and level of opposition. All associations were low, indicating that policymakers and respondents had different views on energy regulations.

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CONSUMER ATTITUDES TOWARD POTENTIALLY RESTRICTIVE ENERGY CONSERVATION REGULATIONS

CHAPTER I

INTRODUCTION

America's industrial economy has gone through three eras of energy resource use: wood (1850's and before), coal (early 1900's), and petroleum (1950's to the present). American petroleum production has peaked and the country has become increasingly reliant on foreign imports of oil and natural gas. Geologists predict that sometime during the next century, the world will exhaust the supply of easily obtainable petroleum and will be forced to rely on other energy sources. The prospect of the imminent depletion of oil resources throughout the world means a transition to a new energy form (Lave, 1980).

To make the transition, U.S. energy policy has been based on several scenarios: conserve, find new petroleum sources along with extracting more from existing wells (secondary and tertiary recovery techniques), develop renewable energy sources such as solar and wind, and increase the use of coal to generate power directly or to produce synthetic fuels. These scenarios represent a mixed energy policy. It has been argued that no single energy strategy is likely to succeed;

an optimum policy mix must be determined (Kranzberg, Hall and Scheiber, 1980). Kaderali (1976) observed that:

> ...efforts to interject energy conservation into the daily decision making process are likely to increase over the next few years. This suggests that there exists a need to develop a process to identify and quantify the energy implications of policy decisions at all levels of government (p. 181).

The Energy Project at the Harvard Business School, Energy Future (Stobaugh and Yergin, 1979), reported that if the United States made a serious commitment to conservation, it might well consume 30 to 40 percent less energy than it did, and still enjoy the same or even higher standard of living. The cost of conservation energy would be competitive with other energy sources. The possible energy savings would be greater than our present level of imported oil.

The potential that conservation offers for total U.S. energy needs is found in one example from a study conducted by Ross and Williams (1977) for the American Physical Society. Their hypothetical consumption was 40 percent less than the actual energy consumption in 1973. "In other words, in 1973 the same U.S. living standard could theoretically have been delivered with 40 percent less energy" (Stobaugh and Yergin, 1979:177). Gibbons and Chandler (1980), in a more recent study, revealed possibilities in relation to projected energy growth to the year 2010 by use of a "scenario" analysis of econometric and engineering analysis techniques. The possibilities included:

--energy use in buildings could decline at an annual rate of .6 percent, compared to an annual rate of increase of three percent currently (in part due to stricter building codes and appliance efficiency standards),

- --electricity could account for 30 to 50 percent U.S. energy consumption in 2010, as compared with 28 percent today, depending on policy actions and the relative prices of other forms of energy,
- --Natural gas could supply 11 percent of total demand, compared with 24 percent now,
- --auto efficiency could double, in part due to stringent federal regulations,
- --energy consumed per unit output of industry in 2010 is 35 percent lower than in 1974.

Gibbons and Chandler (1980) believed that the economic well-being of the U.S. could be maintained while energy growth was diminished. They defined conservation as a term reserved for the policy of substituting new technology or different procedures for energy without reducing the amenities we enjoy. Conservation in an economic sense is a means of leaving society better off than it would be without it and is thus an act of enlightened self-interest.

Energy conservation has also been defined as a reduction in the rate of energy consumption, as a consequence of either more technically efficient use of energy or decreased demands for energy usage. It can occur in "all sectors of energy consumption," although most conservation efforts thus far have been focused on personal consumption in the residential and transportation sectors (Olsen, 1978).

In A Time to Choose (Ford Foundation, 1974), the Energy Policy Project (EPP) authors concluded that this nation's best approach to balancing the energy budget, safeguarding the environment, and protecting the independence of its foreign policy was to reduce growth in energy consumption through policies that encouraged more efficient use of energy.

C. P. Wolf (1979) gave a progress report of ongoing efforts to formulate an agenda for energy-related social research. Wolf argued that previous work concentrated on efforts such as that of Landsberg, et. al. (1974):

> ...identification of those areas of knowledge not directly related to hardware which would be of immediate importance in considering policies affecting energy production, conversion, and use - in order to develop a coherent research plan capable of providing perspective over the entire energy system (p.4-5).

But unlike previous work, Wolf's focus was on the distinctively social (attitudinal, behavioral, and institutional) components of energy related to technologic-economic factors. As Cetron (1974:211) observed, "There has been very little study of the social implications of the energy crisis. Consequently, we find ourselves without social policies."

Figure 1 (Wolf, 1979) is a framework of analysis in the form of a relevance tree. Wolf (1979) stressed that it was not a decision tree of binary forced choices but represented the fact that a comprehensive energy research program must tackle the energy problems at many different points. It aimed to set out some directions for programmatic development.

Hard-path energy alternatives have received the greater emphasis in studies done to date thus research needs to be devoted to the soft-path branch alternatives. The first priority should be to trace conservation and patterns of use through voluntary and mandatory conservation measures (Wolf, 1979).

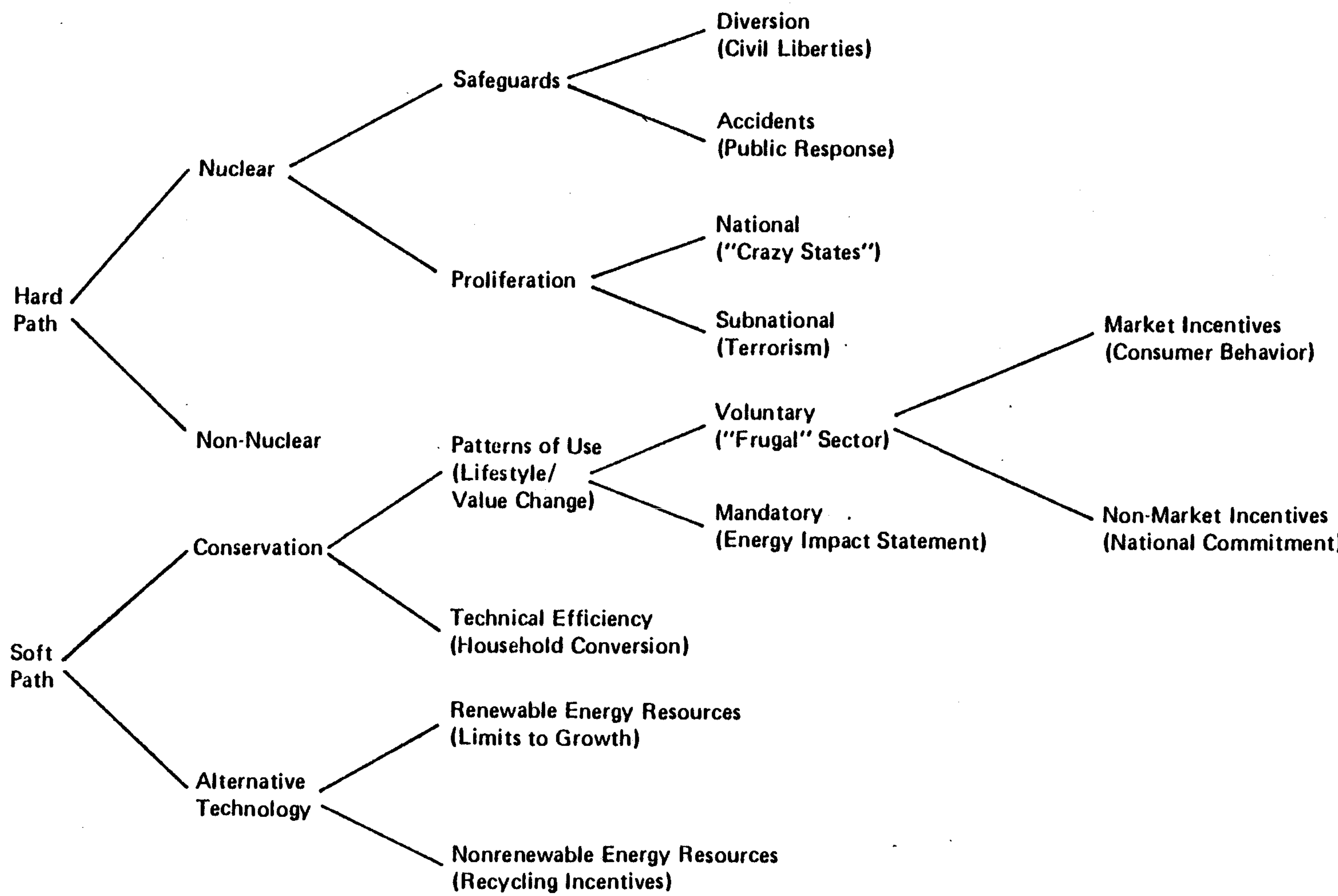

Figure 1. Relevance tree for energy-related social research (Wolf, 1979)

Wolf (1979) placed so much emphasis on conservation because as a research strategy it had been given a high priority by many experts (Dierkes and Coppock, 1977) and increasingly had been seen as a chief instrument of energy policy (Wolf, 1979). "Regardless of the fate of any particular supply technology, conservation is bound to be a major part of the future energy mix" (Wolf, 1979:383).

Voluntary versus Mandatory Energy Conservation

As seen in Figure 1, Wolf (1979) identified both voluntary and mandatory segments as ways to increase energy conservation through life style changes. But voluntary and mandatory actions are not black and white. They vary in the degree of restrictiveness, or limitations, imposed on individuals. Voluntary conservation efforts include initiatives taken by business, individuals, or organizations to conserve energy on their own accord for a number of reasons: to save money, for housing resale value, or because of ethical, aesthetic, and patriotic values. Voluntary conservation measures can be restrictive in the sense that not all conservation measures and programs are equitable; for example, the tax credits and other incentives that require financial capital in order to initiate the measure. In addition, many voluntary conservation measures may require sacrifice and value change. In this sense, how restrictive they seem to be will vary from individual to individual.

A mandatory conservation initiative on the other hand, involves a degree of coerciveness. The policies or laws enacted as mandatory are obligatory with the intent being to require all within a jurisdiction to conserve. Mandatory energy conservation laws would restrict, or limit, personal choice and behavior of members of society in an effort to reduce the amount of energy consumed. Mandatory conservation measures will vary in degree of restrictiveness as well. Some laws passed enable or encourage one to conserve but are not obligatory. For example, from 1975 to 1980, several major federal laws concerned with energy conservation were enacted. Included in these laws were residential tax credits for home weatherization and installation of solar collection systems, energy efficiency standards for home appliances, conservation loans to owners of multi-family dwellings, and program guidelines for utilities to improve the energy efficiency of residential customers' homes. In addition, 43 of the 50 states have passed laws which provided financial incentives to encourage home energy conservation (Dillman, D. A., Tripple, P. A., Makela, D. J., Dillman, J. L., and Chatelain, L. B., 1981). There also exist program efforts to encourage voluntary energy conservation behavior through pricing policies. Within each strategy the degree of restrictiveness can vary considerably depending on the specific techniques employed.

The voluntary sector has gained increasing recognition in recent years. But while strong preference has been expressed for adopting voluntary conservation measures there has been considerable doubt as to the effectiveness of such measures (Wolf, 1979). In fact, Wolf (1979) argued that the public expects and demands governmental intervention, and in the end, intervention means coercion. House and Williams (1977) also believed if energy conservation was to become a recognized and broadly dispersed part of the American culture, it must have some mandatory assistance from the federal government. One sponsor of the Energy Policy and Conservation Act noted:

> The process of converting from an inefficient energy society to an efficient one is sufficiently complicated that it cannot be achieved simply by free market forces. There is a necessary and appropriate role for government to play, particularly in the initial stages of making our homes, businesses, and manufacturing facilities more energy efficient (Public Law 94-163, 1975:89 Stat.871).

Regulatory policies (such as conservation standards for all new buildings, mileage efficiency standards for new autos, or conservation rules such as auto excise taxes based on weight or fuel consumption, or allocation schemes such as restrictions on gasoline purchases (Ford Foundation, 1974; Hayes, 1980; Olsen, 1978) have been endorsed by U.S. citizens and researchers, but the researchers revealed that the endorsements were given at a time when respondents were experiencing the "energy crisis" first hand during the oil embargo of 1973-74.

The strategy of using governmental intervention in terms of regulatory strategies directed toward reducing energy consumption is likely to become increasingly necessary in the future (Wolf, 1979). Due to constantly changing political environment views toward energy policies and the imminent depletion of our known fossil fuels, it is important to understand consumer attitudes toward mandatory energy conservation policies (Olsen, 1978; Wolf, 1979). Policies aimed at directly regulating behavior have not been researched extensively. Levels of public acceptance for these regulations today is unknown (Olsen, 1981).

A Social-Psychological Approach to Mandatory Energy Conservation

Social-psychological research can aid the understanding of public attitudes toward present and contemplated energy policies.

> We cannot discuss the problem of shortages, particularly of energy and food, without commenting on some of the psychological consequences that invariably appear. Energy is, above all else, power; and the symbolism of many energy-consuming devices that make up the pattern of modern consumption is that of power.....Moreover, when a shortage of energy or power threatens, the initial psychological impact is to create a feeling of powerlessness, of helplessness, of anxiety, of death -- as though that which has been sustaining us is being exhausted (Smelser, 1979:225).

Smelser (1979) proposed that the prospect of increasing shortages of things we value replicated the classic sociological conditions that were conducive to a panic response. When people are in a panic-stricken frame of mind, what occurs to them is not to guard and save what one has but to get what one can of what is left (i.e., gas lines).

Many psychological and sociological theories could be studied that relate to energy shortages, such as authoritarianism, social influence, group functioning and others. There needs to be continued theoretical progress in placing energy-conserving behavior and attitudes of individuals in the context of psychological knowledge. One theoretical direction, of particular interest to researchers of mandatory energy conservation regulations, is the construct of locus of control - whether an individual believes he has control over what happens to him.

The locus of control concept measures whether or not a person has developed a consistent attitude toward either an internal or external locus as the source of reinforcement and is dependent on past reinforcement experiences.

> When a reinforcement is perceived by the subject as following some action of his own but not being entirely contingent upon his actions, then in our culture, it is typically perceived as the result of luck, chance, fate, as under the control of powerful others, or as unpredictable because of the great complexity of the forces surrounding him. When the event is interpreted in this way by an individual, we have labeled this a belief in external control. If the person perceives that the event is contingent upon his own behavior or his own relatively permanent characteristics, we have termed this a belief in internal control (Rotter, 1966:1).

Mandatory energy conservation regulations can have a large impact on consumer behavior. Therefore, it is necessary to research attitudes, beliefs, socio-demographic differences, and the psychological dimension which may underly the acceptability of these regulations. Also of importance is a comparison between consumers and policy makers attitudes. This brings forth a new dimension of understanding the similarity or differences between consumers and policy makers perceptions of the favorability of energy policy measures. Sound and thorough research is essential to the process of consumer energy policy formulation. This study represents one attempt to provide such research support. It is a study which brings together concepts not previously analyzed as a whole.

Research which would provide guidelines for governmental policies can help gauge anticipated compliance by different socioeconomic groups in an effort to spur voluntary energy conservation action and forecast future trends and problems that may occur as a result of reductions in energy consumption (Olsen, 1978). Therefore, it is important to update policy attitude information and explore a range of variables (particularly psychological) influencing these attitudes and their changes over time.

> The way in which individual consumers view the energy problem will not alter the inescapable fact that the world's deposits of petroleum and natural gas are finite and are expected to be largely depleted within our lifetimes. But the attitudes and beliefs that people hold about this situation will unquestionably affect the policies they support and the actions they take in response to the problem (Olsen, 1981:108-109).

Purpose Statement

The purpose of this study is to understand consumer attitudes toward a scale of potentially restrictive (mandatory) energy conservation regulations. Belief in the seriousness of the energy problem, a psychological measure of internal control, and socio-demographic variables will be examined in relation to consumer attitudes.

Objectives

The objectives of this research are to:

1. investigate the relationships among (a) "internality" (b) belief in the seriousness of the energy problem, (c) attitude of favorability and opposition to each of seven potentially restrictive energy conservation actions, and (d) selected socio-demographic variables,

2. establish a rank ordering of the seven potentially restrictive energy conservation actions based on degree of restrictiveness,

3. associate the differences between 1) the responses of opposition to seven potentially restrictive energy conservation regulations from three main variables: (a) belief in the seriousness of the energy problem, (b) perceived locus of control (internal/external), and (c) socio-demographic characteristics and 2) a predetermined ranked order of restrictiveness,

4. determine whether any of eight demographic variables can predict respondents opposition to each of seven potentially restrictive energy conservation actions, nonbelief in the seriousness of the energy problem, and degree of internality,

5. determine if there are differences among the selected demographic variables and the three most restrictive regulations as ranked by an expert panel.

Limitations

1. The study is restricted to a resurvey of Oregon households responding to the first phase of data collection, plus a new, random sample of Oregon households added to the second phase of data collection.

2. Respondents to this regional questionnaire may have been more energy conscious than the nonrespondents (Tripple, 1982a).

3. The questionnaire from which data for this analysis were taken was not developed specifically for the purpose of this study. Therefore, attitudinal and other measures were sometimes a compromise between what was thought ideal and what was available from the survey instrument.

Hypotheses

H_o1: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Require home thermostats to be no higher than 65°F in winter"

H_o2: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Require home thermostats to be no lower than 78°F in summer"

H_o3: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Require everyone's home to pass an energy 'audit' (must have adequate insulation, double-pane or storm windows, etc.)"

H_o4: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Require utility companies to charge lowest rates to low energy users and highest rates to high users"

H_o5: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Discourage building homes away from towns and cities to lessen travel by car"

H_o6: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Change building codes and mortgage requirements to encourage new types of energy-saving housing"

H_o7: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)"

H_o8: There is no association between the degree of restrictiveness of seven potentially restrictive energy conservation regulations and acceptance of the most restrictive regulations by believers and nonbelievers in the energy problem

$H_0 9$: There is no association between the degree of restrictiveness of seven potentially restrictive energy conservation regulations and acceptance of the most restrictive regulations by respondents with low and high degrees of internality

$H_0 10$: There is no association between the degree of restrictiveness of seven potentially restrictive energy conservation regulations and acceptance of the most restrictive regulations based on any of the eight demographic variables: income, education, urban/rural residency, age, tenure, marital status, type of dwelling, and sex.

Definition of Terms

The following terms are defined as they pertain to the terms used in this dissertation.

Attitude: A learned predisposition to respond to an idea in a favorable or unfavorable manner (Fishbein and Ajzen, 1975).

Belief: A person's subjective probability judgement about some discriminable aspect of his world. Beliefs deal with a person's understanding of himself and his environment" (Fishbein and Ajzen, 1975:131).

Degree of internality: the score assigned to each respondent based on the number of internal responses of the 33 statements in the Internal/External Locus of Control Scale. Each response was given a one (1) if the response was internal and a zero (0) if it was external. From the 33 possible points, a score of 16 and above indicated a higher degree of internality and a score of 15 and below indicated a lower degree of internality.

Energy Conservation: a reduced consumption of energy compared to a previous level of consumption.

External Control: When an individual perceives that a reinforcement is not entirely contingent upon his behavior, then that reinforcement is typically perceived as the result of luck, chance, under the control of others, or as unpredictable (Rotter, 1966). This perception is labeled a belief in external control.

Internal Control: When an individual perceives that an event is contingent upon his own behavior or his own relatively permanent characteristics, it is labeled a belief in internal control (Rotter, 1966).

Mandatory: practices that are obligatory; practice or performance is required.

Mandatory energy conservation regulations: outer-imposed laws or policies (those enacted and enforced by an agency or entity outside the direct control of an individual household) that would restrict, or limit, personal choice and behavior of members of society in an effort to reduce the amount of energy consumed.

Regulation: a rule or order having the force of law issued by an executive authority (government).

Restrictiveness: the degree to which the mandatory energy conservation regulations would change personal behavior, cause personal inconvenience, or change current lifestyle.

CHAPTER II

LITERATURE REVIEW

Energy Policy - An Historical Overview

> Knowledge of where the United States has been in energy policy is essential to determining where it should go (Goodwin, et. al., 1981:xviii).

Energy issues have been of concern to U.S. administrations over the past four decades. But, a recognition of important U.S. energy issues and the attempts to construct public policy to deal with them has been emerging slowly. This recognition has been focused mainly in the federal government, although it also has had some recognition in state governments and in the private sector.

Goodwin et. al. (1981) outlined that energy issues as public policy began with the Truman Administration - one in which the primary responsibility for energy policy lay in one multipurpose federal department (U.S. Dept. of the Interior) and its collateral congressional committees, but with secondary responsibility diffused elsewhere throughout the federal system. The U.S. emerged from World War II with a heightened appreciation of the importance of energy for the economy, and that petroleum would be the most important energy source far into the future. During the Eisenhower and Kennedy years, a complex structure of legislation and control mechanisms permitted the industry, in cooperation with government, to limit supply to conform to demand at arbitrary prices. As the years went on it became necessary to supplement domestic monopolistic devices with restrictions on oil imports, first on a voluntary and then a mandatory basis. The federal government became a major participant in the electric power market and when the nuclear generation arrived, concerns for safety and the environment overwhelmed earlier political doctrine. The Johnson and Nixon administrations proceeded cautiously. Later, the Ford Administration used direct involvement by the Executive Office of the President by establishing innumerable special offices and agencies. Finally, in the Carter Administration, a single executive branch department devoted entirely to energy problems was created. Throughout these administrative periods, task forces, working groups, special committees, and commissions abounded. Practically all were addressing a range of issues that could not be ignored indefinitely, but amazingly little coherent policy was formulated (Goodwin et. al., 1981).

Goodwin et. al. (1981) emphasized, however, that stark changes occurred.

> Above all, the postwar period witnessed a shift from abundant energy and concern about falling prices for producers to desparate shortage and sharply rising prices for consumers. Complicating matters on the world scene generally, the United States moved from a dominant position among its allies to a situation in which power and authority were widely dispersed and in which small and militarily insignificant states could destroy the international and interdependent systems that America had come to count on (p. xvii).

Energy Conservation Policy

It has become, therefore, a reasonable goal for Americans to conserve energy. The question became what kinds of policies could be developed and implemented to significantly reduce energy consumption. Dillman, Tremblay, and Dillman (1977) categorized several possible policies that had been considered by state and federal officials. Short range policies require little time to implement and had immediate effects regarding energy consumption. Middle range policies took more time to implement but had greater potential for reducing energy consumption. Finally, long range policies required a considerable amount of time to implement but a substantial decrease in energy consumption resulted.

Dillman et. al. (1977) further emphasized:

> The development of energy policy does not occur within a vacuum. A policy which is unpopular or which requires great inconvenience has little chance of succeeding. Further, certain policies will effectuate larger energy savings than others. Thus, where an energy package is put together by either state or federal officials, both the detriments and benefits...must be considered (p. 4).

Data existed which were used to assess benefits (such as the Northwest Energy Policy Project in 1976) but similar data to assess the detriments of such policies were almost non-existent. Dillman et. al. (1977) supported the use of preference surveys to indicate the extent to which a series of policies would be acceptable to the public and would lead one to infer which policies would be least inconvenient. The rationale Dillman et. al. (1977) proposed for obtaining such information was that policies which were most acceptable to the public were also likely to be implemented with less resistance than those policies not acceptable. Preference survey results would also indicate what policies are acceptable to different segments of the population (i.e., socio-demographic data).

Additionally, the home represented a perplexing policy target. Federal regulation existed for automobiles and private enterprise (i.e., utilities), but housing was less amenable to direct energy restrictions (Dillman et. al., 1981). The major federal housing legislation aimed at conservation was based on voluntary compliance (incentives). Consequently, proposed legislation that was mandatory (regulatory) and aimed at decreasing energy consumption in homes was not well understood.

Regulatory Energy Conservation Policy

One step in formulating an energy policy was taken in the private sector by the Ford Foundation which, in 1971, authorized the organization of the Energy Policy Project. The objective of this project was to explore the range of energy choices open to the United States and to identify policies that matched these choices. One of the energy choices was regulations. In the first report (Ford Foundation, 1974), the marketplace was viewed as a very important means of carrying out energy decisions, but it was recognized that it would be misleading to speak of the market as though it had an autonomous life of its own.

> "Political decisions, or the lack of them, crucially affect the way the market words. And some of the fundamental decisions affecting energy can be made only by government" (Ford Foundation, 1974:7).

The Ford Foundation stressed that energy regulations could have some important positive effects for society. Where the exact information for energy based decisions is difficult or expensive for a consumer to obtain, energy regulations can help substitute for the "perfect knowledge" that a market economy presupposes. Where energy considerations are a small part of any one individual's buying decision but a large part nationally, regulations can serve to limit the range of choices so that consumers would be led to act in a way that will benefit society in general. Recognizing that a regulatory strategy for energy conservation was one of the strategies that could be used by Congress and state legislatures during a period of transition, it was emphasized in the Ford Foundation Report (1974) that regulations be considered only after careful examination.

In general, consumer energy policies have been classified along two dimensions. In the first dimension, policy has been defined according to whether or not it involved financial or nonfinancial measures. In the second dimension, the degree of coerciveness of a policy was defined along a persuasive versus regulatory or mandatory spectrum (Claxton, et. al., 1983). Policy makers choosing from program options defined by these dimensions must make trade-offs between the effectiveness and the social acceptability of the available alternatives. Claxton et. al. (1983) outline four criteria of "success" for energy conservation: (1) probable energy savings, (2) cost effectiveness, (3) impact on consumers, and (4) enforceability of the policy. Criteria (3) and (4) pertain to this particular study.

The impact on consumers. Alternative policies to meet conservation objectives could have substantially different impacts upon consumers. On an overall basis, what was of most concern to policy makers was the level of acceptability of alternative policies by consumers. In Claxton et. al. (1983) at least three factors were considered to exert a significant influence on consumer acceptability: they were the extent to which the policy (1) reduced consumer choice, (2) caused inconvenience to consumers, and (3) impacted fairly across all groups of consumers. Socio-demographic data along with attitudinal data allowed for comparison in terms of consumer impact.

From a policy formulation standpoint, it was clear that actions which did not reduce consumer choice substantially, which caused little inconvenience, and whose impacts were perceived to be fairly distributed throughout the population would gain greater acceptance than actions which violated these criteria (Claxton et. al., 1983).

The enforceability of the policy. Even the most prominent energy policy would prove of relatively little value if it were difficult to enforce or if the costs of enforcement were unduly high. In one study, consumers, when asked to rate the acceptability of various policy alternatives, tended to be more opposed towards energy conservation policies simply because they felt such policies could not be effectively enforced (Claxton et. al., 1983).

Perhaps the most important message from the previous research was that the issue of energy policy demanded serious and continuing national attention grounded in a better understanding of the energy choices and their implications. Some proposed an economic approach to energy (Hirst, et. al., 1982; Mead and Utton, 1979). But while economic theorists provided a conceptual framework for consideration of conservation policies, the theories dealt mostly with the proper rate of use of energy resources, cost/benefit analyses of alternative policies, or mechanisms of the marketplace. Social science researchers could also play a role in determining the part regulations would play in an energy policy. Many researchers, in both the physical and the social sciences, have suggested that neglecting the energy consumer was tantamount to ignoring a potentially enormous source of energy savings (Shippee, 1980; Stern and Gardner, 1981; Stobaugh and Yergin, 1979).

McKenzie (1983) argued that for long-term energy conservation policies to be effective, efficient, and equitable, much more attention must be paid to attitudes, their relationship to situations and behavior, and their plasticity (likelihood of large, permanent change) rather than elasticity.

Joerges and Olsen (1979) pointed out that developing general support for energy conservation involves social change, a widespread change in values or life goals related to national resources. At this level, sociological and political concepts and models are appropriate. Thus, McKenzie (1983) proposed a social-psychological model. This model was required to (1) identify important elements of inputs from authorities (policy makers), (2) identify relevant characteristics of the household or family and its situation, and (3) describe interactions between these, and predict consequences for the household in terms of energy saving behavior and side-effects.

Because the social-psychological approach that McKenzie (1983) proposed concerning conservation has not been researched extensively, that approach was used in this study.

A Psychological Approach to Mandatory Energy Conservation

In examining the available literature and research related to energy conservation, a scattered collection of studies attempted to apply knowledge of attitudinal processes, social influence, and group functioning to questions related to energy conservation. Some attitude-behavior studies found that norms, beliefs, and behavioral intentions were closely related to specific energy-using behaviors and could be predictive of these energy-using behaviors (Seligman et. al., 1979; Stern and Gardner, 1981). Despite these accomplishments, however, there have been serious shortcomings in psychological research on energy to this time. Stern and Gardner (1981) reported:

> Most of the research has taken an intuitive and atheoretical approach that, while justifiable as an immediate response to perceived crisis, is not appropriate for dealing with on longer range energy problems. An unfortunate result has been that most of the research has concentrated on actions with limited potential for alleviating energy problems, while actions with much greater potential have been neglected (p. 331).

Of particular interest to mandatory energy conservation regulations, is the construct of locus of control - whether an individual believes one has control over what happens to oneself. This construct was chosen to be included in this study. The internal/external locus of control literature focused on studies related to the concept of control. This was because internal/external measures have not been applied to the area of energy conservation and studies relating to control were deemed the best ones related to mandatory energy conservation.

Internal/External Locus of Control Construct

An Internal/External Control of Reinforcement Scale (I-E Scale) was constructed by Rotter (1966) as a self-report measure of generalized belief that a person can control his own destiny. The role of reinforcement, reward, or gratification is universally recognized as a crucial one in the acquisition and performance of skills and knowledge. An event, however, is perceived differently among individuals in terms of reward or reinforcement. External control will be referred to as "external(s)" and internal control will be referred to as "internal(s)."

In the first expository paper dealing with the control dimension (Rotter, Seeman, and Liverant, 1962), the construct was described as distributing individuals according to the degree to which they accepted personal responsibility for what happened to them. As a general principle,

> ...internal control refers to the perception of positive and/or negative events as being a consequence of one's own actions and thereby under personal control; external control refers to the perceptions of positive and/or negative events as being unrelated to one's own behaviors in certain situations and therefore, beyond personal control (p. 474).

The Internal/External Control Scale (Rotter, 1966) differs from concepts such as hopelessness, helplessness, competence, etc. in that it is an integral part of an elaborated social learning theory. It is an expectancy variable rather than a motivational one (Lefcourt, 1966). In Rotter's social learning theory (1954) the potential for any behavior to occur in a given situation is a function of the person's expectancy that the given behavior will secure the available reinforcement, and the value of the available reinforcements of that person. In Rotter's (1954) theory, the control construct is considered a generalized expectancy, operating across a large number of situations, which relates to whether or not the individual possesses or lacks power over what happens to him.

Many researchers have developed modifications of the I-E scale, in attempts to focus on special groups, such as children, and in attempts to simplify and shorten Rotter's original scale. There also exists a plethora of literature on uses of the I-E Locus of Control Construct, from many diverse orientations. However, energy conservation is an orientation that has not been examined.

Mandatory energy conservation regulations imply a loss of control for individuals, a compliance or conformity in an effort to conserve the nation's finite resources. Past I-E control studies that dealt with conformity, demographic characteristics, attempts to control the environment, and achievement/motivation variables were examined.

Locus of Control Dimension Variables

Conformity/reaction to social stimuli. The reactions of "internals" and "externals" to social stimuli have been explored. Rotter (1966) originally suggested that "internals" would be more resistive to manipulation from the environment if they were aware of such manipulation, while "externals" expecting control from the outside world, would be less resistive. Two studies (Getter, 1966; Strickland and Crowne, 1962) that employed verbal conditioning paradigms supported such reasoning.

When identical communications either from a high- or low-prestige source were presented to "internals" and "externals," "externals" changed more in response to a high-prestige source than to a low-prestige source (Ritchie and Phares, 1969). "Externals" also showed greater attitude change than "internals" when both received a communication from a high-prestige source. Joe (1971) concluded that "externals" were more likely to be influenced by the prestige of the source.

Four studies (Crowne and Liverant, 1963; Getter, 1962; Gore, 1963; Strickland, 1962) supported the thought that the individual who perceived that he did not have control over what happened may conform or go along with suggestions when there is a conscious alternative. However, if such suggestions or attempts at manipulation are not to his benefit, or if he perceives them as subtle attempts to influence him without his awareness, he reacts resistively.

Attempts to control the environment. Perhaps the most important kind of data to assess the construct validity of the internal/external control dimension involves the attempts of people to better their life conditions, that is, to control their environment in important life situations.

> It is in this sense that the I-E Scale appears to measure a psychological equivalent of the sociological concept of alienation, in the sense of powerlessness (Rotter, 1966:20).

Several early investigations have shown that "internals" exhibited more initiative in their efforts to attain goals and to control their environments than did externals (Phares, 1965; Seeman, 1963;

Seeman and Evans, 1962). Davis and Phares (1967) noted that "internals" made more attempts than "externals" to actively seek information relevant to influencing the attitude of another person concerning the war in Vietnam.

Phares (1965) hypothesized that internal subjects were able to exert more influence upon others than were external subjects.

> Internals, having the generalized expectancy that they are in control of their own behavior-reinforcement sequences, should thus be more effective agents in the induction of change than individuals not having such an expectancy (p. 643).

Gore and Rotter (1963) obtained signed commitments from students at a southern black college regarding activities to be undertaken during vacation in behalf of the civil rights movement. Students who were willing to take part in a march on the state capitol or to join a freedom riders' group were clearly and significantly more "internal" than those who were only willing to attend a rally, were not interested in participating at all, or avoided even filling out the requested form. They demonstrated that those individuals who are inclined to see themselves as determiners of their own fate tended to commit themselves to personal and decisive social action.

Strickland (1965) attempted to further elaborate Gore and Rotter's (1963) findings in an effort to predict behavioral commitment. She hypothesized that persons involved in social action would be more "internal" than those persons not engaged in social action. Strickland's sample consisted of black students (predominantly college) who were either involved in the civil rights movement or just attending a civil rights rally. Her study confirmed the hypothesis, validated a personality inventory assessing internal control versus external control of reinforcement, as well as added a description of the persons involved in social action. Strickland found no significant relationships between the internal/external score and age and amount of education; however, she found that the active group was older and had completed more grades of school. She concluded that perhaps commitment to social action attracts an older or more educated person.

Phares (1965) in a more stringent test of a generality of internal/external control attitudes selected two samples, one internal and one external, on the I-E scale but matched for the attitudes towards maintaining fraternities and sororities on campus. He instructed both groups to act as experimenters to change the attitudes of other students. He found, as hypothesized, that his internal subject-experimenters were significantly more successful in changing attitudes of others than the external subject-experimenters, who did not differ significantly in the amount of change achieved from a control group who were not subject to any influence condition.

Seeman (1964) studied workers in Sweden with a translated version of the I-E scale. Seeman's results seemed to clearly point to the fact that membership in unions versus nonmembership activity within the union, and general knowledge of political affairs were all significantly related to being internally controlled. Correlations were low, but significant and held up when controlled for variables such as education, age, and income.

There is evidence to conclude that internals, in contrast to externals, showed a greater tendency to seek information and adopted behavior patterns which facilitate personal control over their environments (Joe, 1971). Straits and Sechrest (1963) and James, Woodruff, and Werner (1965) reported evidence that "internals" can not only control their environments but also their own impulses better than "externals." These two studies showed that smokers were more external than nonsmokers and that those individuals who stopped smoking following the Surgeon General's report were more internally oriented than those who did not stop.

This group of studies lends strong and relatively consistent support to the hypothesis that a generalized expectancy - that one can affect the environment through one's own behavior - is present in at least two different cultures, can be reliably measured, and is predictive of logical behavioral and construct referents.

Achievement/motivation. Julian and Katz (1968) raised the question of whether the need to predict one's outcomes was a motivational component of internal/external control orientations. They found that the internals adopted self-determining strategies under chance conditions as well as skill conditions.

> One possibility suggested by the literature is that the internal control orientation involves as a motivational aspect a need to predict one's outcomes (Julian and Katz, 1968:93).

This inference was most closely reflected in the work of Seeman and Evans (1962) and Seeman (1963). In Seeman's research (1963), internals knew significantly more information regarding the determinants of important life outcomes.

> Perhaps, in the present competitive game, internals preferred self-determining strategies because they yielded more information about relevant capabilities. Even under the chance condition, the internals may have been trying to evaluate the response-outcome contingencies, though to a lesser extent than under the clearly defined skill setting (Seeman, 1963:93-94).

Seeman and Evans (1962) demonstrated that patients in a tuberculosis hospital who scored toward the internal end of the continuum knew more about their physical condition, were better informed about the nature of tuberculosis, and were seen by hospital personnel as being more informed, better patients than were externals.

Gender and perceived locus of control. When sex differences were considered, there was a tendency for women to regard the locus of control for reinforcement as more external than men. This has held over the fifteen years separating two major samples concerning normative scores from the I-E Scale (Cellini and Kantorowski, 1982). What has changed, however, is the mean score; the most recent sample indicated scores in the more external direction. Their investigation suggested that there is a real, generalized trend towards more externally-oriented college students. Social observers have concluded that society has indeed become complex and individuals do feel they have less control over their lives (Cellini and Kantorowski, 1982).

Based on the above related studies, it is expected that "internals" would be more likely to oppose mandatory energy conservation regulations because mandatory energy conservation regulations imply a loss of control. Externals, already feeling a loss of control, would be more likely to accept the regulations.

Energy Conservation Research

A Theoretical Approach

A theoretical approach to four variables - beliefs, attitudes, intentions, and behavior - increasingly is being adopted to energy conservation research (Olsen, 1981). A theoretical approach developed by Fishbein and Ajzen (1975) emerged with the framework of a general theory first proposed by Fishbein in 1963.

In this approach, belief represented the information a person had about an object; attitude was a "learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object"; intention referred to a person's intentions to perform various behaviors; and behavior consisted of observable acts which were studied in their own right (Fishbein and Ajzen, 1975:131).

Fishbein and Ajzen (1975) suggested that on the basis of direct observation or information received from outside sources or by way of various inference processes, a person learned or formed beliefs about objects. The totality of a person's beliefs serves as the information base that ultimately determines his/her attitudes, intentions, and behavior. A person's attitude about some object is determined by his/her beliefs that the object has certain attributes and by his/her evaluations of these attributes. However, attitude towards an object is related to the whole set of beliefs about the object rather than necessarily to any specific belief. Attitude leads to a set of intentions about performing a variety of behaviors in relation to the object. Attitude is related to the set of intentions as a whole, and attitude toward an object will usually not be related to any specific intention in relation to that object. Fishbein and Ajzen (1975) regarded each intention as being directly related to the corresponding behavior, and, barring unforeseen events, a person should perform those behaviors he/she intends to perform.

This research was limited to two belief variables due to the availability of the variables in an existing data base: belief in the seriousness of the energy problem, and perceived locus of control. These two beliefs may not be adequate to serve as basic determinants of an attitude favoring or opposing mandatory energy conservation, but may be adequate as a rough approximation. However, the general theory can still be applied.

Literature Overview

Consumer energy research can be segmented into two general categories: first, research that was primarily focused on understanding consumers (that is, what are consumers thinking and doing about energy conservation), and second, research that was primarily focused on the impact of energy conservation policies and programs (Claxton, et. al., 1983). In a number of studies conducted since the early 1970's, researchers focused on these two categories, attempting to profile the energy consumer - analyzing beliefs, attitudes, intentions, and behavioral responsiveness to the energy crises of 1973-74 and 1977, as well as impacts of such crises on energy consumption

(Barnaby and Reizenstein, 1975; Bartell, 1976; Bee Angell and Associates, 1975; Blakely, 1976; Bultena, 1976; Burdge et. al., 1976; Curtin, 1976; Doering, Fezi, Gauker, Michaud, and Pell, 1974; Donnermeyer, 1977; Gottlieb, 1978; Gottlieb and Matre, 1975; Gottlieb and Matre, 1976; Hannon, 1975; Hass, Bagley and Rogers, 1975; Heberlein, 1975; Hummel, Levitt, and Loomis, 1978; J. M. Vilada Co., 1974; Johnson, 1974; Keck, Erlbaum, Milic, and Trentacoste, 1974; Kilkeary, 1975; Kostynicuk and Recker, 1976; Milstein, 1978; Milstein, 1977b; Morrison and Gladhart, 1976; Muchinsky, 1976; Murray et. al., 1974; Olsen, 1978; Patterson, 1975; Peck and Doering, 1976; Perlman and Warren, 1975; Sears et. al., 1976; Stearns, 1975a; Stearns, 1975b; Talarzyk and Omura, 1975; Thompson and MacTavish, 1976; Warren and Clifford, 1974; Wright, 1975).

Belief and attitude description studies. The study by Claxton et. al. (1983) concluded that the significant differences in viewpoints toward selected consumer conservation programs appeared to be derived from two main causes. First, there were differences that appeared to reflect an economic dimension. Second, there were divergencies that seemed to involve an ideological dimension concerning the extent to which government intervention was necessary or desirable. The following review of energy conservation research supports this proposition.

Barnaby and Reizenstein (1975) grouped and profiled respondents according to gasoline consumption and heating preference levels for the home in an effort to identify the energy-conscious consumer. Exposure to media and source of personal information were major factors. Income was also an effective discriminator. Barnaby and Reizenstein (1975) also found that between February and October of 1974 (two studies were conducted) major energy changes seemed to increase awareness of energy shortages. Respondents in the later study reached greater agreement with proposed policies (rationing energy fuels and the need for controlling home temperature by law).

Respondents in Bee Angell and Associates' study (1975) were willing to make sacrifices in energy consumption only if the need were severe and responsibility shared by all. In Blakely's study (1976), place of residence was the main variable. Urban, suburban and rural residents of Sacramento Valley were surveyed. Respondents across residence and location classes held similar opinions on the energy crisis and its overall consequences but the real dichotomy was found between urban and rural respondents with regard to the role of government in solving the problem. Rural and suburban respondents were more opposed to direct government intervention and controls than urban respondents. Rationing was disapproved by all segments of the sample. Morrison and Gladhart (1976) also found urban and rural respondents differing on energy policies.

Guthrie and Jones (1982) found a significant difference between rural and urban beliefs about the seriousness of the U.S. energy problem. Rural respondents were more likely to feel the energy problem was very serious. No significant differences were found between rural and urban residents regarding beliefs about whether to meet our future energy needs via increased production or energy conservation, and regarding several specific policy alternatives. The rural respondents were, however, more often opposed or strongly opposed to many of the policy alternatives than were the urban respondents.

Bultena's study (1976) focused on socio-economic groups in Des Moines, Iowa and their attitudinal perceptions of the energy crisis. Middle and lower class respondents more often blamed activities of large oil companies and concomitant governmental favoritism, whereas upper class respondents tended to perceive the energy shortage in terms of dwindling energy reserves.

Only 36 percent of Indiana respondents, in a survey by Doering et. al. (1974) reported that the energy crisis had any real effect on their life-styles. Donnermeyer (1977) studied the consistency between attitudes, intention, and behavior through an examination of the social status and attitudinal prediction of willingness to practice energy conservation measures and of the actual energy consumption in the home. Overall the respondents tended to be in favor of conservation. Examination of the correlation coefficients between items within the attitude and behavior sets demonstrated that there are few significant associations. In terms of conservation regulations, a majority of respondents agreed that there should be conservation regulations, including a special tax on automobile manufacturers who produce low mileage vehicles.

Heberlein (1975) found that neither the energy crisis nor the attempt to "engineer" a behavior change influenced electricity consumption in 96 apartments near Madison, Wisconsin. This held true in a follow-up study a year later after the Arab oil embargo.

Hannon (1975) concluded, based on his study using secondary data from the U.S. Dept. of Commerce, Edison Electric Institute, and other sources for various years from 1925 to 1975, that there are probably no popularly acceptable solutions to energy conservation.

Support for mandatory conservation actions was analyzed by Hummel et. al. (1978). These actions had benefits for energy and air pollution problems but entailed life-style costs. Two samples were obtained in Ft. Collins, Colorado; one when gasoline was abruptly scarce and the other after the gasoline shortage reached normalcy. They were interested in behavioral intentions of the respondents to comply with conservation policies, one of which was respondents' willingness to support voluntary and mandatory controls on energy resource accessibility. Hummel et. al. (1978) found that perceived impact of an energy crisis on an individual and his/her family was a fairly powerful predictor of the respondent's behavioral intentions and actual levels of compliance with conservation policies. When people perceived the crisis as affecting them personally, and perhaps severely, conservation behaviors changed. In both samples blaming environmentalists was negatively related to support for mandatory actions that would attack air pollution as well as energy problems and was a positive predictor for pro-energy actions that would damage the environment. Those blaming individual consumers also supported mandatory remedies.

This finding was also supported by Sears et. al. (1976), Hass et. al. (1975) and Gottlieb and Matre (1975) in that increases in the perceived severity of an energy shortage elicited stronger intentions to conserve. Hass et. al. (1975) concluded that informational programs should stress the severity of the energy problem. Their study showed that increments in the perceived noxiousness or severity of an energy crisis strengthened intentions to reduce energy consumption. Overall, however, increases in the perceived likelihood of an energy shortage had no effect.

Gottlieb and Matre (1975) stated, "The majority of people are willing to endorse those energy conserving policies and programs which will cause them the least in the way of personal inconvenience or expense" (p. 113). A pre-embargo sample and a post-embargo sample of urban and rural counties in Texas were drawn to discern perceptions, attitudes, behavior and expectations in response to the energy crisis by Gottlieb (1978). The only major difference found between the two regional samples was a greater concern about anticipated escalating costs of energy expressed by the post-embargo sample. Both samples failed to see the energy crisis as of long-term consequence. Lack of knowledge about energy sources and appliance energy-consumption characteristics were found to be correlated with lack of belief in the energy crisis. Respondents believed that the more real the perception of the crisis or emergency, the more responsible the populace would become, and that the shortage was more a political contrivance than the result of the world running out of fuel.

Skepticism regarding the energy crisis was supported by Gottlieb and Matre's (1975) study of randomly selected heads of households (n=782) in four different geographic areas of Texas. But in their follow-up study (Gottlieb and Matre, 1976) the majority of respondents had come to accept the proposition that the world was running out of fuel. There was a slight increase in belief in a serious, long-term energy crisis.

Changes in travel behavior in New York state during the 1973-74 energy crisis was the focus of a study conducted by Keck et. al. (1974). Overall, the energy crisis did not induce significant changes in travel habits for most people in the communities sampled (n=300).

Another study conducted in New York (Kilkeary, 1975) found car ownership, education, and family composition (number, ages, and sex) to be positively related to energy knowledge scores. In relation to changed practice scores, exposure to extended blackouts, direct payment of utility bills, car ownership, the belief U.S. families can together affect the energy crisis, and family composition were positively related. The strongest influence on knowledge and conservation was income. Those families who could afford to pay energy price increases did, while moderate-income families tended to strive to save energy.

The link between attitudes and behavior has been researched regarding energy conservation. Milstein (1978) found that virtually everyone in his sample seemed to be for conservation in the abstract, but evidence suggested a gap between attitudes and energy conservation behavior. Reasons for this seem to be lack of knowledge, cultural norms of comfort and convenience, and skepticism and cynicism regarding the nature of the energy problem. Milstein (1978) further concludes that the chance to save money may be the most effective incentive, over a conservation ethic, patriotism, or concern for one's progeny. Financial reward, as an effective inducement, was followed by feedback, exhortation, and information. In Milstein's study (1978) concerning energy policy messages of the Carter Administration, he concluded that the President's address seemed to produce significant changes in awareness of and attitudes toward the energy crisis. Policy proposals which hit closest to home were the least preferred.

In terms of residential energy consumption, Morrison and Gladhart (1976) found that belief did not diminish in any meaningful way the energy consumed in a household. Demographically, income proved to be the single best indirect predictor of residential energy consumption. Higher income families consumed more energy. Families in child-rearing stages also consumed more than other families.

Muchinsky (1976) found undergraduate students (n=328) blaming oil companies for the energy crisis while petroleum company executives faulted government. In a study by Murray et. al. (1974) however, respondents generally regarded the government to be responsible for the energy crisis. Opinions were not found to be significantly related to demographics tested.

Patterson (1975) concluded from his study of 60 homeowners in Pennsylvania, that attitudes toward preserving the environment would become more negative as the costs to those holding the attitudes increased. Peck and Doering (1976) concluded that among rural users, voluntarism cannot be relied upon to reduce consumption substantially. They interpreted their results as reinforcing the need for higher prices to induce fuel-use efficiency.

Analyses of attitudes by Stearns (1975b) showed that social status is positively correlated with shortage perception; household evaluation of its financial status is negatively correlated with expected duration of the energy shortage; and negative evaluations of household energy shortage impacts are positively correlated with dissatisfaction with regard to enacted energy conservation policies. It was also found that households became less tolerant of conservation policies as they experienced the energy shortage.

Warren and Clifford's (1974) approach was to assess the effect of neighborhood typology (six varieties) on individual attitudes and responses to the energy crisis in eight Detroit area communities. They concluded that the typology provided an important source of explained variance in perceptions, reported behaviors and helpful sources of information. "Integral" and "stepping-stone" neighborhoods were highest in perceiving the energy crisis as real, while the "anomie" type was lowest.

Marganus, Olson, and Badenhop (1982) found favorable attitudes toward energy conservation and renewable energy sources to be similarly related to perceived seriousness of the energy problem, age, income, and location. People who considered meeting the nation's energy needs in the future to be a serious problem, held favorable attitudes toward both reducing energy consumption and developing renewable energy sources. Socio-demographic variables were also analyzed. Younger respondents, urban residents and white collar occupational status all tended to be more favorable toward reducing energy consumption and toward renewable energy sources.

In terms of energy consumption, Martin et. al. (1982) reported that a favorable attitude toward reducing energy consumption was more prevalent among those respondents who reported engaging in more energy saving practices than among those who reported less such activity. This also was true for younger respondents. Wealthier people and older people were especially reluctant to take steps that would save energy and require changes in life-style.

In a study by Tyler (1982) of black, low income urban tenants, respondents tended to feel more strongly toward items which dealt personally with the energy problems over which they exercised the most control. Tyler found no significant differences in energy related attitudes in relation to demographic characteristics.

Buck and Brandt (1982) in their study using a Western Region Project (W-159) of 8129 individuals tested differences between renters and nonrenters. Renters significantly ($p \leq .05$) preferred voluntary energy conservation policies more than nonrenters, but both favored incentives for home energy conservation. Both, however, opposed a policy which would limit their personal control over their lives.

Zuiches (1976) found some evidence that belief in the reality of the energy problem influenced one's willingness to consider new conservation policies. One of the statements in Morrison, Keith and Zuiches (1976) study was: The only way to get families to conserve energy is by imposing governmental controls. Twenty-three percent of the household respondents agreed, but those who believed in the energy problem tended to be more supportive of the policy. When respondents were asked to assess the potential difficulty of undertaking five energy conservation activities, greater difficulty was reported by nonbelievers in the energy problem.

The relationship between belief in the energy crisis and support for energy policies has been thrown into doubt by other studies, however. Zuiches reexamined his previous data (Olsen, 1981) and discovered that the only conservation policy that retained a significant linkage with belief in the energy crisis was support for gasoline rationing.

Sears et. al. (1976) examined the role of support for the political system in determining attitudes and compliance to actions that government defines as in the public interest. A multistage probability sample (n=1069) of Los Angeles residents aged 18 and over was obtained during February-March 1974. Support for the political system was indicated by diffuse system support, partisanship, the individual's long-standing symbolic loyalties, and personal impact. The personal impact of the crisis had virtually no effect at all in terms of citizen's attitudinal response. Neither system support nor partisanship contributed significantly to behavioral reductions in energy consumption, however, the personal impact of the crisis did. They concluded that personal impact rather than long-standing political attitudes was the major factor in behavioral compliance. Additionally, no relationship was found between belief in the energy crisis and support of proposed governmental conservation policies.

Bultena (1976) investigated belief in an energy crisis, conservation behavior, and attitudes toward conservation policies related to socio-demographic and socio-economic variables. Findings indicated that the greater the personal cost or inconvenience of a regulation, the less public support it would receive. Based on his sample of Los Angeles residents and the effects of the energy crisis on their attitudes and life styles, he stated that

> Energy measures bearing little or no personal cost were generally supported by the public, while energy measures involving significant and substantial personal costs tended to receive less support (p. 45).

In a study of Lexington, Kentucky residents during the 1973-74 energy crisis, Nietzel and Winett (1977) respondents felt that the federal government should take the lead in proposing and administrating mandatory controls. Respondents preferred strategies to increase production of energy rather than strategies to decrease consumption. Also, respondents favored voluntary over mandatory conservation.

Individual responsibility may also be an important variable in determining attitudes toward energy conservation policies. Survey data from Shippee (1980) suggested that when individuals felt responsible for overconsumption, they advocated the implementation of stringent energy policies and also intended to behave more conservatively themselves. When individuals did not perceive of themselves as responsible for energy overconsumption, they did not indicate intentions to conserve energy. Similarly, when people felt that their input into an energy savings program was unlikely to affect overall savings levels for a consuming group as a whole, conservation was unlikely to result (Shippee, 1980).

Existing research suggests that a comprehensive energy policy calling for personal sacrifice is not likely to be supported unless a serious shortage of energy is thought to exist. Olson (1981), however, expressed doubts about the positive linkage between belief in the energy crisis alone and attitudes toward energy conservation behaviors.

> The major conclusion to be drawn...is that belief in the energy crisis is not sufficient by itself to generate acceptance of conservation policies, and may even backfire into rejection of such policies if the situation is seen as virtually hopeless. Apparently belief in the seriousness of the energy problem must be buttressed by (1) awareness of the overall ecological situation, (2) acceptance of personal responsibility and/or expectations, or (3) favorable attitudes toward the current administration, if one is to become a staunch supporter of governmental conservation policies (p. 113).

Olson (1981) argues that the American public appears ready to accept far more rigorous energy conservation policies than are presently in effect. For social scientists, much research remains to be conducted on the link between beliefs and attitudes leading to energy conservation behaviors.

Socio-Demographic Predictors of Belief in the Energy Problem

Cunningham and Lopreato (1977) in a random sample study of Southwest cities (n=10,000) and a subsample (n=801) of all-electric users in Austin, Texas, factor-analyzed 35 attitudinal statements on conservation incentives and generally characterized "believers" in an energy problem in their study as high income, low age, and high education.

Income. The majority of the literature does not support the existence of a relationship between income level and belief in an energy problem. No major differences in belief in the current reality of the energy problem was apparent by income types in the study conducted by Morrison, Keith and Zuiches (1976). Cunningham and Lopreato (1977) however, found a greater percentage of respondents at higher income levels believed in an energy problem but did not feel that the income variable significantly helped to explain differences in belief. Some studies (Kilkeary, 1975; Warren, 1974) showed a curvilinear relationship between social class and belief that an energy problem existed with the middle class most likely to believe in the energy crisis. Other surveys (Cunningham and Lopreato, 1977) showed a linear relationship with respondents at higher income levels more likely to believe in the energy problem.

Education. In considering respondents' belief in an energy problem with differentials by income, sex, age, education, and residential location, Morrison, Keith and Zuiches (1974, 1976) found the greatest difference in belief to be level of education. Cunningham and Lopreato (1977) found no significant relationship between education and belief in an energy problem. However, they concluded that there was some evidence indicating education had a positive influence on belief in an energy problem. Overall, the larger body of literature supports a relationship between education and belief in an energy problem.

Age. The younger and older designated age groups in many studies show a relationship between age and belief in an energy problem. On an age continuum in Gottlieb's (1978) study respondents representing the very youngest and very oldest were not convinced of a long-term energy crisis proposition. Consistent with Gottlieb (1978), Cunningham and Lopreato (1977) and Stearns (1975) also found older respondents less likely to believe in an energy problem and also reported that older respondents believed that energy shortages would be of shorter duration than did younger respondents.

Location of residence. The literature definitely supports significant differences between rural and urban residents and how they perceive the energy problem (Blakely, 1976; Bultena, 1976; Guthrie and Jones, 1982; Marganus, Olson, and Badenhop, 1982; Morrison and Gladhart, 1976). Gottlieb (1978) found urbanites more likely to endorse the long-term energy crisis proposition than rural residents, which was consistent with Morrison, Keith and Zuiches (1976) finding that rural respondents tended to express less belief in the reality of the energy problem than urban respondents.

Tenure. Buck (1982), in a study of Oregon households, found significant differences between renters and nonrenters belief in the seriousness of the energy problem. Renters believed the problem very serious and felt their homes to be less energy efficient.

Sex. Consistent evidence does not exist that support relationships between sex and belief in an energy problem. Males were more likely than females to endorse the long-term energy crisis proposition in Gottlieb's study (1978), but this was not consistent with Zuiches (1976) or Cunningham and Lopreato (1977) who found that women were more likely to believe in the energy crisis. Female respondents in Cunningham and Lopreato's (1977) study also revealed more concern for the present and long-term impacts of the energy problem.

Socio-Demographic Predictors of Attitudes

Income. Income was found to be a fairly good predictor for acceptance of energy conservation policies by Gottlieb (1978), Morrison, Keith and Zuiches (1976), and Olsen (1978). Gottlieb (1978) found that total annual income and age/familial status were the two best predictors for whether or not the Texans in his sample would respond to tax penalties and tax rebates when purchasing an automobile. The more favorable response to a policy of tax rebates for smaller, more efficient autos came from those who were younger, those who were urban dwellers, and those with middle-level incomes.

Morrison, Keith and Zuiches (1976) in a study of Michigan families asked respondents to agree or disagree to several social, economic, and energy issue statements. Twenty-three percent agreed with the statement "The only way to get families to conserve energy is by imposing governmental controls." When responses were compared to income, such a policy was less acceptable to lower income respondents.

Olsen (1978) reported that socioeconomic status was a major determinant. The higher one's socioeconomic status, the more likely one was to support energy conservation policies. The most important factor in this relationship was family income.

Education. In general, studies have shown that the higher a person's education level, the more likely he or she is to adopt conservation measures and to accept the need for future conservation programs though the programs were not made explicit (Barnaby and

Reizenstein, 1975; Bultena, 1976; Gottlieb, 1978; Morrison, Keith and Zuiches, 1976; Thompson and MacTavish, 1976; Zuiches, 1976).

Gottlieb (1978) found that respondents with more formal education (80% of college graduates versus 59% of those who had not completed high school) showed a stronger conviction toward endorsing a long-term energy crisis proposition. Thompson and MacTavish, in a 1976 random sample survey of a metropolitan area, studied beliefs, attitudes and behavior in relation to energy use. The group that adopted few or no conservation measures tended to be less educated. College-educated respondents reported adopting a variety of conservation measures.

Age. The literature supporting a relationship between age and energy conservation attitudes is sketchy. The attitudes of different age groups varies with the policies, or actions, under consideration. Gottlieb (1978), in his study with Texans, found that the age group most likely to endorse vigorous enforcement of the 55 mph speed limit were the elderly. Also, when asked, "In order to cut gasoline use, should or should not the President be given authority to gradually raise the tax on gasoline?", the age of the respondent was the only factor which appeared to account for variations in response. Those between the ages of 21 and 55, the age group in which one would find the highest levels of full-time employment, were the least supportive of providing the President with the authority to raise gasoline taxes.

Cunningham and Lopreato (1977) found younger respondents to be more likely to assign responsibility for the energy problem to others, in particular private corporations, energy companies and business. The younger respondents also expressed more discontent about what was being done about the energy problem. Thompson and MacTavish (1976) reported that older respondents in their sample adopted few or no conservation measures.

Location of residence. As with the belief question, place of residence does make a significant difference in respondent attitudes. Place of residence played a significant role in whether Texans said they would or would not add home insulation, given a federal tax credit. Those most likely to respond in the affirmative were residents of metropolitan areas; those least likely to accept a tax credit were residents of smaller towns and rural communities (Gottlieb, 1978). Gottlieb (1978) also found that residents of nonurban areas were most likely to endorse vigorous police enforcement of the 55 mph speed limit than were urban residents.

Tenure. In a study of Oregon households, Buck (1982) compared renters and nonrenters and their attitudes toward conservation requirements such as setting thermostats to 65°F in winter, and having an energy audit. Renters and nonrenters were opposed to these policies unless "they did not directly affect the personal control of energy conservation or unless they benefitted renters or nonrenters" (p. 107). For example, renters and nonrenters opposed the requirement to set thermostats for heating no higher than 65°F in the winter, but generally favored the requirement to set thermostats for cooling no lower than 78°F in the summer. Since air conditioning is not common in Oregon, there is minimal loss of personal control. In the proposed requirement that everyone's home pass an energy audit, however, renters favored and nonrenters opposed such a requirement.

Sex. As with the belief question, there is no consistent data concerning the relationship between sex and energy conservation attitudes. In Gottlieb's (1978) study, women were among the group who most strongly endorsed the 55 mph speed limit. Olsen (1981) reported no consistent difference between men and women in attitudes toward the energy problem.

Summary of Energy Conservation Research

Beliefs and attitudes toward energy conservation and their socio-demographic/socio-economic predictors is sketchy. Conclusions are difficult to draw for a number of reasons: relatively few studies have been conducted, the analyses used to assess relationships have been simple, and the literature that exists focuses on enough different variables (different demographics, different regions of the country, different energy conservation policies) that it is difficult to bring them all together in predicting beliefs and attitudes among U.S. citizens concerning energy conservation in general.

However, some directional conclusions can be made. Lack of knowledge about energy conservation and proposed energy regulation policies are positively correlated with lack of belief that the nation is threatened by a serious energy problem. People tend to believe that the more real the energy crisis is in terms of personal impact, the more responsible the populace will become toward wise energy use. When one examines the research data obtained during the energy crises of the 1970's, however, it is clear that even during an energy crisis, long-term changes in energy conserving behavior did not occur. What occured during these energy crises was dissatisfaction with enacted energy conservation policies.

The primary discriminator seemed to be perceived impact of inconvenience to the consumer in both economic expenditures and life-style changes. Many of the researchers (Bultena, 1976; Gottlieb and Matre, 1975; Marganus, et. al., 1982; Milstein, 1978; Patterson, 1975; Tyler, 1982) indicated the perception that stronger intentions to conserve and increased willingness to consider new conservation policies by respondents were elicited if the respondents perceived the crisis effecting them personally, or perhaps severely. Acceptance was more likely for energy conservation policies and programs that caused people the least in terms of personal inconvenience or expense. Personal inconvenience or expense may have also accounted for the gap between favorable attitudes toward proposed energy conservation policies and programs and energy-conserving behavior. The contradictory findings linking belief in an energy problem and support of energy conservation policies could also be attributed to the differences among respondents, their perception of the personal inconvenience, and expense of the proposed policies.

The literature supported the idea that the chance to save money may be the most effective incentive for saving energy. This relates to the finding that attitudes toward energy policies are favorable among those already engaging in energy-saving practices. It is not known if these respondents are engaging in energy-saving practices to save money or because they perceive themselves as responsible for the energy problem due to overconsumption. If people thought that their efforts were unlikely to effect overall savings levels, conservation was unlikely. There was no reward.

It does seem relatively clear, however, that those studies which did pose questions concerning mandatory types of policies, received less than enthusiastic approval unless specific criteria existed. With the exception of Claxton, et. al. (1983) and Dillman, et. al. (1977), studies are directly concerned with mandatory conservation policies and predictors of their favorability is nonexistent.

CHAPTER III

METHODOLOGY

The data for this study were taken from a larger longitudinal data base obtained by the Western Regional Agricultural Experiment Station Technical Committee (W-159) "Consequences of Energy Conservation Policies for Western Region Households." Nine western states and Pennsylvania participated in the project. Data from the 1983 Oregon sample only were used for analysis in this study.

Data Collection

The data used in this study were collected in the spring of 1983 as the second phase of this longitudinal project. The questionnaire was developed, pilot tested, and revised by researchers in the participating states. A copy of the questionnaire and letters to the sample population are included in Appendix A.

Dillman's (1978) Total Design Method (TDM) was the procedure used for the data collection. The two guiding principles are to personalize the letter of introduction that accompanies the questionnaire, and to follow-up with non-respondents. An initial questionnaire was sent on February 15, 1983 with three follow-up steps that continued through April, 1983. Provision was not made for assessing the reliability of the W-159 responses. However, the researchers were very much aware that over time respondents attitudes and beliefs could be influenced by external factors. Therefore, all participating states mailed out the common questionnaire on the same date, February 15, 1983, and followed a regionally-set follow-up procedure and time schedule (Tripple, 1982a). Great care was taken to obtain face, content and construct validity in the 1981 questionnaire (Tripple, 1982b). The same efforts were taken in the 1983 phase of the project.

Sample

A total of 893 respondents were included in this study. The 1983 sample consisted of two parts. Participants in the 1981 data base were included along with a new sample. The 1983 new sample was a randomly selected, proportionately representative rural/urban sample. In Oregon, this proportion was 60 percent urban and 40 percent rural. Telephone directories served as the sampling frame. The overall response rate was 65.2 percent.

The Delphi Panel

A Delphi Panel was used to establish a rank order of the restrictiveness scale of eleven energy conservation regulations. The Delphi technique was originally developed at the Rand Corporation in the late 1940's as a systematic method for soliciting expert opinion on a variety of topics, including technological forecasting. Delphi applications have been used to forecast many social phenomena, including human attitudes and values, and even the "quality of life" (Reisman et. al., 1969).

The result of a Delphi study is a presentation of observed expert concurrence in a given application area where none existed previously.

This assumes that participating panelists are experts in the subject area, and that the reported consensus was obtained through reliable and valid procedures. Those procedures, established by the Rand Corporation, (Reisman, et. all, 1969) were utilized in this study. The objective of a Delphi techniques application is qualitative evaluations.

The format of the Delphi application in this study was using a paper and pencil questionnaire consisting of a series of qualitative items (scales). A set of instructions, along with a cover letter, were mailed to energy related experts in Oregon and adjoining states. Participants were asked to rank the eleven energy conservation statements from most restrictive to least restrictive. A definition of mandatory energy conservation regulations was provided along with the instructions. Once the first round of results were returned (n=24, 80%) averages were tabulated for each regulation. Panel members were then sent a copy of the results from the first round, with the most restrictive regulation listed first, along with their own original ranking. They were asked to compare their original ranking with the results of the panel averages, and, for the purposes of achieving a consensus, they were instructed to rerank the regulations a second time. The results of the second ranking (n=20) were then tabulated, based again on averages, and used in establishing the final scale. Copies of the panel instructions, cover letter and names of the panel members are in Appendix C.

The panel originally consisted of 30 selected energy experts from Oregon and adjoining states. The criteria used in selecting panel members were that they worked in an energy or closely related field. Therefore, panel members were: legislators serving on energy subcommittees, energy extension agents, city planners, state housing officials, Oregon Dept. of Energy officials, energy commission officials, public and private utility company representatives, and university personnel involved in energy research.

Statistical Analysis

All statistical analyses were conducted at the University of Wyoming Computer Center. Several analyses were used: frequency distributions, logistic regression, log-linear analysis, The Kendall Tau Coefficient, and Kendall's Coefficient of Concordance. The statistical package, BMDP (Biomedical Computer Programs, P-Series) was used for all analyses except The Kendall Tau Coefficient which was computed using a local program and Kendall's Coefficient of Concordance which was hand calculated.

Logistic Regression

The purpose of logistic regression in this study was to determine the probability that a respondent would (1) oppose, Y=1, or favor, Y=0, seven different energy conservation regulations, (2) not believe, Y=1, or believe, Y=0, in the energy problem, and (3) have a low score of internality, Y=1, or a high score, Y=0. This probability is a function of the tendency for Y to vary with eight socio-demographic variables (income, education, rural/urban residency, age, tenure, marital status, type of dwelling, and sex).

Logistic regression analysis is similar to standard regression and analysis of variance models. All are statistical tools which utilize the relation between two or more quantitative variables so that one variable can be predicted from the other, or others. A regression model is a formal means of expressing the two essential ingredients of a statistical relation - a tendency of the dependent variable Y to vary with the independent variable or variables in a systematic fashion, and a scattering of observations around the curve of statistical relationships (Steel, 1980).

Logistic regression models are used when the response variable Y is dichotomous (or categorical) rather than continuous and when the variable to be modelled is a probability. The logistic models permit the use of both continuous and discrete independent variables. When all of the independent variables are discrete, the logistic analysis is similar to the log-linear analysis. However, in the logistic case the one dependent variable Y is selected to be 'explained' by the other variables. Figure 2 is helpful in comparing both logistic regression and log-linear analysis to regression analysis and ANOVA.

The general functional form of the logistic model is:

$$P(Y=1|x_1, x_2, \ldots x_8) = \frac{e^{\beta_o + \beta_1 x_1 + \ldots \beta_1 x_8}}{1 + e^{\beta_o + \beta_1 x_1 + \ldots + \beta_1 x_8}} \tag{1}$$

$$P(Y=0|x_1, x_2, \ldots x_8) = 1-P(Y=1|x_1, x_2, \ldots)$$

$$= \frac{1}{1 + e^{\beta_o + \beta_1 x_1 + \ldots + \beta_1 x_8}}$$

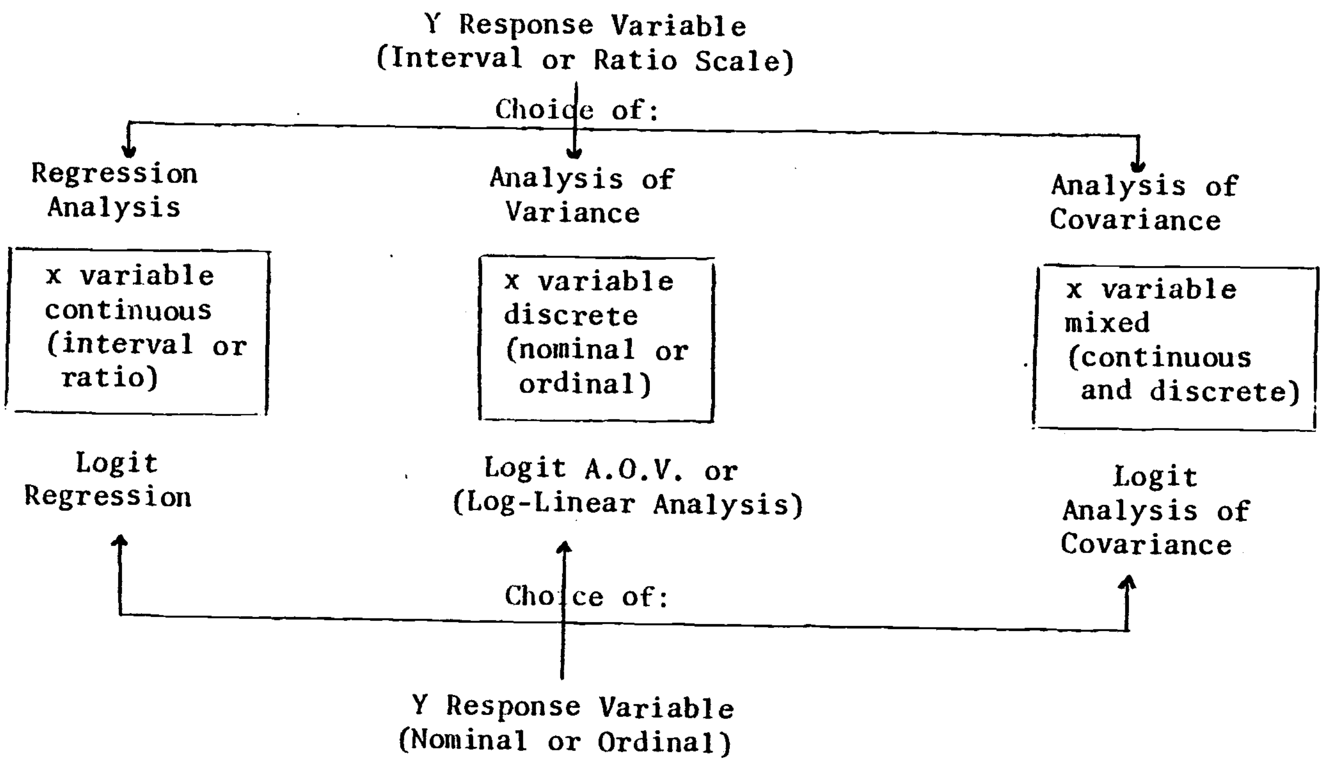

Figure 2
Comparison of logistic regression and log-linear analysis to regression and ANOVA

The logistic function is bounded by 0 and 1, and has been found to provide good models in a wide variety of applications.

In summary, whenever Y is a categorical response variable, logistic models provide a flexible and general approach to regression problems, where the x variables may be continuous, categorical, or a mixture. The interpretation of coefficients in the model is similar to standard regression; tests of significance are available within the BMDP statistical package.

Log-Linear Analysis

The purpose of a log-linear analysis is to obtain descriptions of the relationships among all the factors included in a high order contingency table. Theoretical models are produced which identify all two factor effects, three factor effects, and so forth. In the statistics that result, information is provided about the interactions of these factors based on fitting a hierarchical log-linear model to the cell frequencies; that is, the logarithm of the expected cell frequency is written as an additive function of main effects and interactions in a manner similar to the usual analysis of variance model.

The log-linear model containing all possible effects is referred to as the saturated model. An example of a saturated model with four factors is expressed in equation (2) (BMDP, 1981):

$$\ln F_{ijk\ell} = \theta + \lambda_i^{A} + \lambda_j^{B} + \lambda_k^{C} + \lambda_\ell^{D} + \lambda_{ik}^{AC} + \lambda_{i\ell}^{AD} + \lambda_{jk}^{BC} + \lambda_{j\ell}^{BD} + \lambda_{k\ell}^{CD} + \lambda_{ijk}^{ABC} + \lambda_{ij\ell}^{ABD} + \lambda_{ik\ell}^{ACD} + \lambda_{jk\ell}^{BCD} + \lambda_{ijk\ell}^{ABCD} . \quad (2)$$

The λ's are called effects, with the superscripts indicating the variables to which the effect refers. The λ effects in model (2) may be interpreted in a manner similar to that of the analysis of variance with respect to tests of significance. These effects can also be interpreted in the multiway contingency table. For example, λ^A would correspond to the 'main effect of factor A' in the analysis of variance context. In the contingency table, significance of this effect would imply that the proportion of respondents falling in the respective categories of factor A are not all equal. The significance of a second order effect λ^{AB} in equation (2) would imply that a test for independence in the two way contingency table involving factors A and B would be rejected. The primary advantage of the log linear analysis is that it permits identification of higher order effects in multiway tables in a way that is not possible (or at least very difficult) using chi square tests.

The log-linear models developed in this study included the following variables: degree of internality, belief or nonbelief in the seriousness of the energy problem, favor or oppose attitude toward seven different energy conservation regulations, and any of eight socio-demographic variables that were found to be significant predictors in the logistic regression analysis.

The Kendall Tau Coefficient

The tau statistic (τ) is essentially a difference between two proportions: the proportion of pairs having the same relative order in both rankings minus the proportion of pairs showing different relative orders in the two rankings. Instead of treating the ranks themselves as though they were scores and finding a correlation coefficient, as in Spearman's Coefficient of Rank Correlation (r_s), in the computation of τ, only the number of inversions for pairs of individuals in the two rankings is used. When two rankings are identical, no inversions exist (Hays, 1973).

This leads to the following definition of the statistic:

$$\tau = 1 - \frac{2 \times (\text{number of inversions})}{\text{number of pairs of objects}} .$$

This is equivalent to

$$\tau = \frac{(\text{number of times rankings agree about a pair}) - (\text{number of times rankings disagree about a pair})}{\text{total number of pairs}} .$$

τ for a population can be defined as a corresponding difference between probabilities. For this reason, sample τ provides an unbiased estimate of its population counterpart.

Kendall's Coefficient of Concordance

Kendall's coefficient of concordance was utilized with the Delphi Panel, to test the extent to which panel members were similar in their ranking of the degree of restrictiveness scale. For each of the 20 panel members, eleven regulations were ranked. How much the ranks tended to agree, or show concordance, was tested, using Kendall's statistic, W, the "coefficient of concordance." Basically,

$$W = \frac{\text{variance of rank sums}}{\text{maximum possible variance of rank sums}} .$$

Because the mean rank and the variance of the ranks each depend only on N (number of judges) and m (number of regulations), this reduces to (Hays, 1973):

$$W = \frac{12\Sigma_j T_j^2}{m^2 N(N^2-1)} - \frac{3(N+1)}{N-1} .$$

Description of Variables

Internal/External Locus of Control Scale

As mentioned previously, many I-E scales have been developed based on Rotter's original scale (1966). The I-E scale selected for purposes of this study was developed by Nowicki-Strickland (1973). The Nowicki-Strickland (1973) I-E scale for adults was chosen due to its ease in administration, contemporary popularity, excellent validity and reliability, supporting literature, and because of the availability of a standardized scale (O'Reilly and Ebata, 1981).

The Nowicki-Strickland Locus of Control scale is a paper-and-pencil measure consisting of 40 questions that are answered either "yes" or "no" by placing a mark next to the question. This form of the I-E measure was derived from work which began with a larger number of items (n=102) constructed on the basis of Rotter's (1966) definition of the internal-external control of reinforcement dimension. Due to space restrictions on the questionnaire, not all 40 questions were administered. Seven statements which closely resembled other remaining statements were eliminated. A balance of internal and external statements was retained (see questionnaire in Appendix A).

Possible scores for the I-E scale ranged from zero to 33. The score indicated "degree of internality." A score of 33 indicated the most internally controlled. If one or more of the 33 statements was not answered, that respondent's I-E score was not computed.

The scores in this study ranged from 14 to 33. Distribution was skewed as shown in Table 1. The mean was 25.3 for a sample of 707 (186 missing respondents). For purposes of statistical analysis the mean was used as the dividing point to divide the I-E distribution into a high and low group.

Mandatory Energy Conservation Regulations

Respondents indicated whether they favored or opposed each of eleven energy directions statements. Seven of the eleven statements were chosen for analysis in this study: (1) Require home thermostats to be no higher than 65°F in winter, (2) Require home thermostats to be no lower than 78°F in summer, (3) Require everyone's home to pass an "audit" (must have adequate insulation, double-pane or storm windows, etc.), (4) Require utility companies to charge lowest rates to low energy users and highest rates to high users, (5) Discourage building homes away from towns and cities to lessen travel by car, (6) Change building codes and mortgage requirements to encourage new types of energy-saving housing, and (7) Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.). The other four statements were eliminated because they were not determined to be restrictive upon an individual and/or household. This determination was based on the high percentages of favorability by the respondents and the results of the Delphi Panel ranking.

The regulations are presented in Table 2 in rank order based upon their restrictiveness as determined by the Delphi Panel. Respondents had the choice of answering each regulation according to a five-point scale: strongly oppose, oppose, neutral, favor, or strongly favor. In the calculation of frequencies (percentages), those responses which were coded as neutral, were not analyzed. Those who responded as strongly oppose and oppose were combined in one category, and those who responded as either favor or strongly favor were combined. Sample sizes vary for each regulation based upon neutral responses and missing values.

Table 2 shows that there are some differences between the favorable/opposed rating by respondents and the restrictiveness ranking by the Delphi Panel. The respondents in the sample were not given a restrictiveness criterion to respond to when indicating their favor or oppose attitude to the eleven regulations. Therefore, when respondents' percentages of favor and oppose are placed next to the Delphi Panel ranking, it is clear that ranking doesn't necessarily follow an increasing pattern of favorability. For example, the regulation least favored by the respondents is "Discourage building homes away from towns and cities to lessen travel by car." However, this regulation is ranked fifth on the scale of restrictiveness by the Delphi Panel. "Require utility companies to charge lowest rates to low energy users and highest rates to high users" was favored by 69.7% of the respondents yet ranked third on the scale of restrictiveness by the Delphi Panel.

Table 1.
Internal/External Locus of Control Scale

Low			High		
Score	%	n	Score	%	n
14	.3	2	65	12.3	87
15	.4	3	27	11.2	79
16	1.1	8	28	10.0	71
17	1.4	10	29	7.9	56
18	1.6	11	30	5.4	38
19	1.8	13	31	4.0	28
20	3.4	24	32	1.1	8
21	4.5	32	33	.3	2
22	4.5	32			
23	9.1	64			
24	9.6	68			
*25	10.6	71			
Total	48.3	338**		52.2	369**

*sample mean = 25.3
**Missing values = 186

Table 2.
Delphi Panel Ranking of Eleven
Potentially Restrictive Energy Conservation Regulations
and Percentages of Favorability and Opposition
by Sample Respondents

Regulation		Favor	Oppose	Neutral
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	n	299	432	162
	%	40.9	59.1	
*Panel Average = 1.50 (most restrictive)				
2. Require home thermostats to be no higher than 65°F in winter	n	242	512	139
	%	32.1	67.9	
Panel Average = 2.65				
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	n	677	85	131
	%	88.8	11.2	
Panel Average = 4.40				
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	n	517	225	151
	%	69.7	30.3	
Panel Average = 4.45				
5. Discourage building homes away from towns and cities to lessen travel by car	n	121	548	224
	%	18.1	81.9	
Panel Average = 5.00				
6. Require home thermostats to be no lower than 78°F in summer	n	399	315	179
	%	55.9	44.1	
Panel Average = 5.65				
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	n	582	111	200
	%	84.0	16.0	
Panel Average = 6.30				
8. Rely on state instead of federal programs to encourage energy conservation	n	476	94	323
	%	83.5	16.5	
Panel Average = 8.30				
9. Provide larger tax credits for adding home solar heating or cooling	n	632	102	159
	%	86.1	13.9	
Panel Average = 8.95				
10. Require utilities to provide regular reports to users on whether energy use is higher or lower than in previous years	n	653	65	175
	%	90.9	9.1	
Panel Average = 9.15				
11. Provide larger tax credits for improving home energy efficiency	n	663	103	127
	%	86.6	13.4	
Panel Average = 9.25 (least restrictive)				

*Panel Average equals the total ranking for each regulation divided by the total number of the Delphi Panel respondents (see Appendix E)

Belief in the Seriousness of the Energy Problem

Respondents gave their opinion to a four part question about whether the United States' energy needs during the next 10-20 years were a serious problem or not. Table 3 presents the distribution of responses for this question. Clearly, the majority of respondents (93.8%, n=785) believe that energy is a national problem, but only 23 percent (less than one-quarter) believe it is a "very serious problem."

Table 3
Is energy a serious national problem?

	Percent (%)	Sample size
Not a serious problem	6.2	52
A somewhat serious problem	28.0	234
A serious problem	42.5	356
A very serious problem	23.3	195
Total	100.0	837*

*Missing values = 56

Socio-Demographic Variables

Rural/Urban Residency. There were 436 (48.8%) rural respondents and 456 (51.1%) urban respondents (one missing value). This is a fairly even split for the study sample, but it is not proportionate to 1980 Census figures (CPRC, 1983) for Oregon which were ~67 percent urban and ~33 percent rural.

Type of Dwelling/Tenure. The greatest number of respondents, 88.9 percent (n=690), reported living in "a one family house detached from any other house" (see Table 4). This is an overrepresentation of single family homes when compared to the ~67 percent single family housing reported by the 1980 Census figures for Oregon (CPRC, 1983). Respondents living in "mobile homes or trailers," 9.8 percent (n=86) were only slightly larger than the Oregon 1980 Census of approximately eight percent. There were 48 (5.5%) respondents living in "a building for two to four households." This was also higher than the 1980 Census figures (~3.5%) (CPRC, 1983). The one category where the number of respondents was underrepresented was for those living in "a building for five or more households." There were 33, 3.8 percent, compared to approximately 14.5 percent in the 1980 Oregon Census figures (CPRC, 1983). Seventeen respondents (1.9%) responded to an "other" category. These respondents were not included in any analysis. Due to the underrepresentation of urban respondents compared to the Oregon population, it is likely that those living in buildings housing five or more households were not sampled adequately. It is expected that more buildings with five or more households would be located in urban areas.

Table 4.
Type of Dwelling

Description	Percent (%)	Sample size
mobile home or trailer	9.8	86
one-family house detached from any other house	88.9	690
a building for two to four households	5.5	48
a building for five or more households	3.8	33
other	1.9	17
Total	100.0	874*

*Missing values = 19

The tenure (homeownership status) of respondents was also overrepresented in the study sample with 85.4 percent (n=746) of the respondents owning their home (see Table 5). Two categories, "owned by you" and "owned in condominium by you," were collapsed into one category because both dealt with ownership of the home in which they presently lived. According to the 1980 Census figures for Oregon (CPRC, 1983), homeowners represented approximately 65% of the population. Thus, renters in the study sample were underrepresented with only 12.9 percent (n=133) while approximately 35 percent of the 1980 Oregon Census were renters. Using telephone directories as sampling frames for mail surveys poses certain limitations. Renters tend to be more mobile than homeowners and may not be listed in telephone directories. Additionally, renters may be more difficult to reach using mail survey techniques and may account for much of the undeliverable returns. Therefore, it is not surprising to find a higher percentage of homeowners in this study.

Table 5.
Tenure

Description	Percent (%)	Sample size
rented by you	12.9	133
owned by you, owned in condominium by you	85.4	746
other	1.7	15
Total	100.0	874*

*Missing values = 19

<u>Marital Status</u>. Marital status was defined in five categories (see Table 6). The majority of respondents, 74.8 percent (n=646) in the study were married. This was a higher proportion than the percentage of married people in Oregon (~60%) (CPRC, 1983). The other category overrepresented when compared to Oregon Census figures were the widowed. Ten percent (n=87) of the respondents were widowed compared to approximately 6.5 percent of the Oregon population. Those categories which were underrepresented in comparison to the Oregon population included: divorced, 7.6 percent (n=66) in the sample, approximately nine percent in Oregon; separated, 0.3 percent (n=3) in the sample, approximately two percent in Oregon; and never married, 7.2 percent (n=62) in the sample, approximately 24 percent in Oregon.

Table 6.
Marital Status

Description	Percent (%)	Sample size
married	74.8	646
divorced	7.6	66
widowed	10.0	87
separated	.3	3
never married	7.2	62
Total	100.0	864*

*Missing values = 29

Age. The age distribution for the respondents under 65 was fairly even (see Table 7). Age was an open-ended question, therefore, categories were formed for purposes of this research based upon Murphy and Staples Model (1979) on family life cycle. Originally a category of 15-21 years was included but only four respondents (0.5%) were in this category. They were combined with the 22-35 years age category to produce the 15-35 age category. Compared to 1980 Census figures for Oregon (CPRC, 1983) the 15-35 age group is underrepresented, while all other age groups are overrepresented in the sample. Census figures reported are as follows: 15-35 years (~35.8%), 36-50 years (16.0%), 51-65 years (~14.0%), and 65 and over (~11.5%).

Table 7.
Age

Description	Percent (%)	Sample size
15-35 years	27.0	227
36-50 years	26.3	221
51-65 years	28.3	238
65 and over	18.4	155
Total	100.0	841*

*Missing values = 52

Sex. Attempts were made during the data collection to obtain an even distribution of male and female respondents. In the cover letter with the questionnaire, 50 percent of the sample were directed to the female head of household, while the other 50 percent were directed to the male head of household (see letters in Appendix A). The majority of respondents in the sample were male, 57.4 percent (n=485). There were 360 female respondents (42.6%). It is not known if more male heads answered and returned the questionnaire or whether male heads answered in the place of directed female heads that produced the uneven distribution in this study. Males were overrepresented in the sample when compared to 1980 Census figures for Oregon (CPRC, 1983) by approximately 8.4 percent.

Education. Table 8 shows the highest level of education indicated by the respondents. The questionnaire had eight categories. For purposes of this study, "0-8 grades" and "some high school" were collapsed into one category; "trade school" and "some college" were collapsed into another category; and "some graduate work" and "a graduate degree" were collapsed into one category. The five resulting educational categories were used for analysis. The only educational data available from the 1980 Census for Oregon were percentages of residents over 25 years of age who had completed high school (approximately 75.6%). It is not known what percentage of the population achieved higher educational status. The number of respondents in the study who had received more education than high school was large (62.8%).

Table 8.
Education

Description	Percent (%)	Sample size
0-8 grades/some high school	13.8	118
high school graduate	23.4	201
trade school/some college	34.3	294
college graduate	11.4	98
some graduate work/a graduate degree	17.1	147
Total	100.0	858*

*Missing values = 35

Income. Response to income in the questionnaire was not open-ended. Respondents had a choice of nine categories (see questionnaire in Appendix A). Categories were collapsed into six categories representing $10,000 increments. This was done to achieve consistency with part of the original question (categories seven and eight represented a $10,000 spread). For this analysis the lower income categories of 'less than $5,000' and $5,000-$9,999' were combined; '$10,000-$14,999' and '$15,000-$19,999' were combined; and '$20,000-$24,999' and '$25,000-$29,999' were combined. The remaining three categories ($30,000-$39,999, $40,000-$49,999, and $50,000 or more) were left as in the questionnaire. Results are reported in Table 9.

Median income for Oregon households (in 1979 dollars) as reported in the 1980 Census figures for Oregon (CPRC, 1983) was $16,781. The median income for the study sample fell in the $20,000-$29,999 category. Income of respondents in the study is higher compared to the 1980 Census figures for the overall Oregon population.

Table 9.
Income

Description	Percent (%)	Sample size
less than $9,999	15.6	129
$10,000 to $19,999	25.5	210
$20,000 to $29,999	26.4	218
$30,000 to $39,999	15.8	130
$40,000 to $49,999	7.9	65
$50,000 or more	8.8	73
Total	100.0	825*

*Missing values = 68

Summary

The respondents in this study tended to be male, homeowners, have a high school education, reside in rural areas, be over age 35, and have higher incomes than the average individual in Oregon, as compared to the 1980 Oregon Census (CPRC, 1983). Therefore, the inferences from this study are limited to people with these characteristics, rather than the Oregon population as a whole.

CHAPTER IV

RESULTS

Statistical analyses for this study were conducted at the University of Wyoming Computer Center using BMDP (Biomedical Computer Programs, P-Series, 1981). Analyses included: logistic regression, log-linear, The Kendall Tau Coefficient, and Kendall's Coefficient of Concordance.

Logistic Regression

Logistic regression was used to obtain models based on socio-demographic variables for predicting probabilities of nine dependent variables: belief in the energy problem, opposition to seven potentially restrictive (mandatory) energy conservation regulations, and degree of internality. The coefficients for each model indicate the direction and magnitude of the effect of the significant socio-demographic variables in the model on the probability of the nine dependent variables. These coefficients are derived from the following equation.

$$P(Y=1|x_1, x_2, \ldots x_8) = \frac{e^{\beta_o + \beta_1 x_1 + \ldots + \beta_1 x_8}}{1 + e^{\beta_o + \beta_1 x_1 + \ldots + \beta_1 x_8}}$$

$$P(Y=0|x_1, x_2, \ldots x_8) = 1-P(Y=1|x_1, x_2, \ldots)$$

$$= \frac{1}{1 + e^{\beta_o + \beta_1 x_1 + \ldots + \beta_1 x_8}}$$

The significance levels for entering or removing factors, and a summary of the stepwise entry of variables into the final model and the changes in log likelihood are located in Appendix B.

Belief in the Energy Problem

Two socio-demographic variables, sex (p=.0006) and education (p=.0171) significantly affected the dependent variable concerning whether or not respondents believed the U.S. was facing an energy problem. Based on the signs of the coefficients (Table 10), the resulting model indicated that those respondents represented in the three categories of education - 0-8 grades/some high school, high school graduate, and trade school/some college - have a higher probability of not believing there is an energy problem. The coefficient of .612 means males have a higher probability of not believing in the energy problem than females. The estimated probabilities from the overall model (see Appendix D, Table D-I) range from .6 percent for females with graduate level education to 13.6 percent for males with 0-8 grades/some high school.

Table 10.
Logistic Model for Belief in the Energy Problem

(1) COEFFICIENTS OF THE MODEL[a]

Term		Coefficient	Standard Error	Coeff/S.E.
Sex		.612	.183	3.350
Education Level	*(1)	-1.049	.613	-1.710
	(2)	-1.443	.824	-1.752
	(3)	.665	.322	2.068
	(4)	.865	.336	2.576
	(5)	.962		
Constant		-3.414	.288	-11.854

* (1) = graduate work/graduate degree compared with lowest educational level
(2) = college degree compared with lowest educational level
(3) = trade school/some college compared with lowest educational level
(4) = high school graduate compared with lowest educational level
(5) = 0-8 grades/some high school compared with all other educational levels

[a]The BMDP statistical package allowed all variables with $p \leq .10$ or lower to be included in the final model. Significance levels for entering and removing terms are in Appendix B, Table B-I.

"Require Home Thermostats to be no Higher than 65°F in Winter"

The logistic regression model for this regulation had two socio-demographic variables that were significant - rural/urban residency (p=.0264) and age (p=.0405). As seen in Table 11, rural/urban residency, with a coefficient of -.184, indicated that rural respondents had a higher probability of opposing this regulation than did urban respondents. The strongest differences in the age variable were seen with the youngest age group (15-35 years). This group (15-35 years) had a lower probability (coefficient of -.381) of opposing this regulation compared to the other three age groups (36-50, 50-65, and over 65). The age group, over 65 years, had the highest probability of opposing this regulation. This is not surprising when health concerns are taken into consideration. The estimated probabilities from the model ranged from 55.1 percent for urban residents in the 15-35 age group, to 82.3 percent for rural residents over 65 (see Appendix D, Table D-II).

Table 11.
Logistic Model for Home Thermostats 65°F in Winter

(1) COEFFICIENTS OF THE MODEL[a]

Term		Coefficient	Standard Error	Coeff/S.E.
Rural/Urban		-.184	.082	-2.233
Age	*(1)	.210	.167	1.262
	(2)	.041	.139	.298
	(3)	.130	.144	.900
	(4)	-.381		
Constant		.832	.085	9.821

* (1) = 65 years of age and over compared with youngest age group
(2) = 51-65 years of age compared with youngest age group
(3) = 36-50 years of age compared with youngest age group
(4) = 15-35 years of age compared with all other age groups

[a]The BMDP statistical package allowed all variables with $p \leq .10$ or lower to be included in the final model. Significance levels for entering or removing terms is in Appendix B, Table B-II.

"Require Home Thermostats to be no Lower than 78°F in Summer"

Age (p=.0919) was the only socio-demographic variable that effected this regulation. The significance level was above the .05

level established for this study but the default for the BMDP statistical package was .10 so it allowed the variable 'age' into the final model. Since it was the only socio-demographic variable that entered the final model (see Table 12) it is discussed here. Based on the signs of the coefficients (positive for the two younger age categories and negative for the two older age categories) opposition to the regulation was more likely with the two younger age categories (15-35 years and 36-50 years). The corresponding predicted probabilities (see Appendix D, Table D-III) (oldest to youngest) are 37 percent, 39 percent, 50 percent, and 45 percent that are opposed to this regulation.

Table 12.
Logistic Model for Home Thermostats 78°F in Summer

(1) COEFFICIENTS OF THE MODEL[a]

Term		Coefficient	Standard Error	Coeff/S.E.
Age	*(1)	-.245	.166	-1.470
	(2)	-.156	.137	-1.139
	(3)	.292	.136	2.151
	(4)	.109		
Constant		-.292	.083	-3.536

* (1) = Over 65 years of age compared with youngest age group
(2) = 51-65 years of age compared with youngest age group
(3) = 36-50 years of age compared with youngest age group
(4) = 15-35 years of age compared with all other age groups

[a]The BMDP statistical package allowed all variables with $p \leq .10$ or lower to be included in the final model. Significance levels for entering or removing terms is in Appendix B, Table B-III.

"Require Everyone's Home to Pass an Energy Audit"

The socio-demographic variable tenure (p=.0019) was the only significant variable in the final model (see Table 13). With a coefficient of .366, homeowners have a higher probability of opposing the regulation requiring everyone's home to pass an energy audit. The estimated probability from the model for opposing this regulation ranged from 43 percent for renters to 61 percent for homeowners (see Appendix D, Table D-IV).

Table 13.
Logistic Regression Model for Energy Audit

(1) COEFFICIENTS OF THE MODEL[a]

Term	Coefficient	Standard Error	Coeff/S.E.
Tenure	.366	.117	3.126
Constant	.085	.117	.726

[a]The BMDP statistical package allowed all variables with p≤.10 or lower to be included in the final model. Significance levels for entering or removing terms is in Appendix B, Table B-IV.

"Require Utility Companies to Charge Lowest Rates to Low Energy Users and Highest Rates to High Users"

This regulation also had only one socio-demographic variable that was significant - age (p=.0002). The probability of opposing this regulation was higher with the two older age groups (51-65 years and over 65 years), with coefficients of .511 and .109 respectively (see Table 14). The range of predicted probabilities of opposing this regulation ranged from 21 percent for those 15-35 years of age, and 27 percent for those 36-50 years of age, to 41 percent and 32 percent for those 51-65 years of age and those over 65 years of age (see Appendix D, Table D-V).

Table 14.
Logistic Regression Model for Utility Rates

(1) COEFFICIENTS OF THE MODEL[a]

Term		Coefficient	Standard Error	Coeff/S.E.
Age	*(1)	.109	.168	.651
	(2)	.511	.138	3.694
	(3)	-.129	.146	-.883
	(4)	-.491		
Constant		-.857	.088	-9.750

* (1) = Over 65 years of age compared with youngest age group
(2) = 51-65 years of age compared with youngest age group
(3) = 36-50 years of age compared with youngest age group
(4) = 15-35 years of age compared with all other age groups

[a]The BMDP statistical package allowed all variables with $p \leq .10$ or lower to be included in the final model. Significance levels for entering or removing terms is in Appendix B, Table B-V.

"Discourage Building Homes Away from Towns and Cities to Lessen Travel By Car"

This regulation had the most (four) significant socio-demographic variables. It was also the most opposed regulation out of the seven analyzed. Those significant variables included were: rural/urban residency (p=.0005), tenure (p=.0541), sex (p=.0332), and education (p=.0004) (see Table 15).

Rural respondents have a higher probability of opposing this regulation than do urban respondents (coefficient of -.815). Homeowners have a higher probability of opposing than do renters (.155). When these two variables were tested for an interaction, it was significant (p=.0210). Based on the sign of the interaction coefficient (.498), rural homeowners have the highest probability of opposing this regulation. Predicted probabilities (see Appendix D, Table D-VI) of opposing this regulation ranged from 53 percent for urban homeowners to 100 percent for rural homeowners.

The sex of the respondent, with a coefficient of -.226, indicated that females have a higher probability of opposing this regulation than males do. Levels of education vary. The two highest levels (college graduate and graduate work/degree) with coefficients of -.615 and -.350 respectively, have low probabilities of opposing the regulation. Those levels with the highest probability of opposing were high school graduates (coefficient of .757), and those with trade school/some college (coefficient of .373). The interaction between sex and education was significant (p=.0510). Those most likely to oppose are females with a college degree, some college/trade school or 0-8 grades/some high school in terms of education.

Table 15.
Logistic Regression Model for Discouraging Travel

(1) COEFFICIENTS OF THE MODEL[a]

Term		Coefficient	Standard Error	Coeff/S.E.
Rural/Urban (A)		-.815	.214	-3.814
Tenure (B)		.155	.213	.730
(A) * (B)		.498	.211	2.360
Sex (C)		-.226	.127	-1.776
Education (D)	*(1)	-.350	.243	-1.442
	(2)	-.615	.251	-2.450
	(3)	.373	.208	1.794
	(4)	.757	.260	2.915
	(5)	-.165		
(C) * (D)	**(1)	-.630	.244	-2.586
	(2)	.497	.249	1.996
	(3)	.087	.206	.425
	(4)	-.224	.261	-.859
	(5)	.270		
Constant		1.523	.214	7.105

* (1) = graduate work/graduate degree compared with lowest educational level
(2) = college degree compared with lowest educational level
(3) = trade school/some college compared with lowest educational level
(4) = high school graduate compared with lowest educational level
(5) = 0-8 grades/some high school compared with all other educational levels

** (1) = graduate work/graduate degree and females compared with lowest educational level and males
(2) = college degree and females compared with lowest educational level and males
(3) = trade school/some college and females compared with lowest educational level and males
(4) = high school graduate and females compared with lowest educational level and males
(5) = 0-8 grades/some high school and females compared with all other educational levels and males

[a]The BMDP statistical package allowed all variables with $p \leq .10$ or lower to be included in the final model. Significance levels for entering or removing terms is in Appendix B, Table B-VI.

"Change Building Codes and Mortgage Requirements to Encourage New Types of Energy-Saving Housing"

Age was a significant variable (p=.0609) for this regulation (see TAble 16). Opposition was highest for those 36-50 years and for those 51-65 years of age (coefficients of -.268 and .464 respectively). Predicted probabilities of opposition to this regulation ranged from seven percent for those 15-35 years of age and six percent for those 65 and older; to 12 percent for those 36-50 and 14 percent for those 51-65 years of age (see Appendix D, Table D-VII). It is likely that those respondents who are homeowners would fall into the 36-50 and 51-65 age groups and would be more likely to oppose this regulation.

"Require Land Developers to Have Energy Plans as Part of Their Developments"

This regulation had one socio-demographic variable that was significant - sex (p=.0009) (see Table 17). Based on the coefficient (.396) males had a higher probability of opposing this regulation than females. The range of predicted probabilities from the model for opposing this regulation were from ten percent for females to 20 percent for males (see Appendix D, Table D-VIII).

Table 16.
Logistic Regression Model for Building Codes

(1) COEFFICIENTS OF THE MODEL[a]

Term		Coefficient	Standard Error	Coeff/S.E.
Age	*(1)	-.471	.310	-1.520
	(2)	.464	.203	2.282
	(3)	.268	.211	1.269
	(4)	-.261		
Constant		-2.256	.141	-16.032

* (1) = Over 65 years of age compared with youngest age group
(2) = 51-65 years of age compared with youngest age group
(3) = 36-50 years of age compared with youngest age group
(4) = 15-35 years of age compared with youngest age group

[a]The BMDP statistical package allowed all variables with $p \leq .10$ or lower to be included in the final model. Significance levels for entering or removing terms is in Appendix B, Table B-VII.

Internal/External Locus of Control

The range of scores for the internal/external measure was 14 to 33, out of a possible 0-33, indicating a high level of internality in the sample. The mean of 25.3, therefore, was used as the high/low dividing point. Three socio-demographic variables were significant in predicting the probability of a low degree of internality. These were education (p=.0000) and income (p=.0413), and tenure (p=.0728). Generally, the lower the educational level, the higher the probability that one's degree of internality score will be low - toward the external end of the scale. Based on the signs of the coefficients (see Table 18), those with high school degrees or less have a higher probability of being more external.

The income variable (based on the signs of the coefficients) indicated that those with an annual income less than $19,999 have

Table 17.
Logistic Regression Model for Land Developers

(1) COEFFICIENTS OF THE MODEL[a]

Term	Coefficient	Standard Error	Coeff/S.E.
Sex	.396	.118	3.347
Constant	-1.773	.118	-14.974

[a]The BMDP statistical package allowed all variables with $p \leq .10$ or lower to be included in the final model. Significance levels for entering or removing terms is in Appendix B, Table B-VIII.

higher probabilities of being more external. In terms of tenure, homeowners are more likely to have low internality scores than renters. The predicted probability of having a low internal score ranged from 80 percent for those respondents with 0-8 grades or some high school making less than $9,999 annually who own their homes, to 20 percent of those respondents with graduate work/degree making over $50,000 annually who own their homes (see Appendix D, Table D-IX).

Table 18.
Logistic Regression Model for Locus of Control Scale

(1) COEFFICIENTS OF THE MODEL[a]

Term		Coefficient	Standard Error	Coeff/S.E.
Tenure		.239	.132	1.810
Education	*(1)	-.927	.261	-4.394
	(2)	-.375	.221	-1.693
	(3)	-.050	.149	-.332
	(4)	.493	.170	2.903
	(5)	.859		
Income	**(1)	-.318	.277	-1.146
	(2)	-.606	.289	-2.099
	(3)	-.160	.203	-.789
	(4)	-.016	.168	-.098
	(5)	.386	.174	2.223
	(6)	.714		
Constant		-.396	.147	-2.688

* (1) = graduate work/graduate degree compared with lowest educational level
(2) = college graduate compared with lowest educational level
(3) = trade school/some college compared with lowest educational level
(4) = high school graduate compared with lowest educational level
(5) = 0-8 grades/some high school compared with all other educational levels

** (1) = Over $50,000 annually compared with lowest income group
(2) = $40,000-$49,999 annually compared with lowest income group
(3) = $30,000-$39,999 annually compared with lowest income group
(4) = $20,000-$29,999 annually compared with lowest income group
(5) = $10,000-$19,999 annually compared with lowest income group
(6) = Less than $9,999 annually compared with all other income groups

[a]The BMDP statistical package allowed all variables with $p \leq .10$ or lower to be included in the final model. Significance levels for entering or removing terms is in Appendix B, Table B-IX.

Logistic Regression Summary

Age was a significant variable in four of the logistic regression analyses. Sex was significant in three out of the seven regulations, and rural/urban residency and tenure were significant in two out of the seven regulations. Education was significant once. Marital status, income, and type of dwelling were not significant predictors for the probability of favoring or opposing any of the seven potentially restrictive energy conservation regulations.

Income, education, and tenure were significant socio-demographic variables for predicting the Internal Locus of Control score. Sex and education were significant when analyzing the probability of whether or not one believes there is an energy problem in the United States. When analyzing the socio-demographic variables for all nine logistic regression models, sex and age were significant the most often (four out of nine models) followed by education (three out of nine models).

Log-Linear Analysis

Log-linear models providing the best fit were selected in a step-wise process by deleting interaction terms from an overspecified model. For each interaction term and main effect in the final model a lambda-parameter was estimated. The interpretation of the results were based on the lambda-parameter. All relationships were significant at the .10 level or lower (see Table 74, p. 141). A negative lambda-coefficient for a particular category decreases the probability that the variable is significant in entering the final model, while a positive lambda-coefficient increases the probability for a variable to be significant in entering the final model. In instances where the lambda-coefficient is zero, no effect on the probabilities exists and therefore, no relationship is assumed. The lambda-coefficients for all categories of a variable are constrained such that they sum to zero. Thus, for a dichotomous variable the lambda-coefficient for one category is the complement of the other category. Therefore, only one lambda-coefficient was reported for dichotomous variables.

H_o1: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Require home thermostats to be no higher than 65°F in winter.

Five two-way interactions were in the best fit model for this regulation: relationships between (1) opposition to the regulation and rural/urban residency (Table 19), (2) opposition to the regulation and belief in the energy problem (Table 20), (3) age and belief in the energy problem (Table 21), (4) degree of internality and rural/urban residency (Table 22), and (5) degree of internality and age (Table 23). The goodness of fit for these models was .5988; the null hypothesis was rejected at the $p \leq .10$ significance level.

Table 19.
Two-Way Interaction and Lambda Coefficient for the regulation "Require home thermostats to be no higher than 65°F in winter" and Rural/Urban Residency

Regulation	Rural Residency
Oppose	.104

Table 20.
Two-Way Interaction and Lambda Coefficient for the regulation "Require home thermostats to be no higher than 65°F and Belief in the Energy Problem

Regulation	Nonbelievers
Oppose	.265

Table 21.
Two-Way Interaction and Lambda Coefficients for the regulation "Require home thermostats to be no higher than 65°F in winter" and Age

Energy Problem	15-35 years	36-50 years	51-65 years	Over 65 years
Nonbelievers	-.311	-.155	.084	.381

Table 22.
Two-Way Interaction and Lambda Coefficients for Degree of Internality and Rural/Urban Residency

Degree of Internality	Rural Residency
Low	.090

Table 23.
Two-Way Interaction and Lambda Coefficients for Degree of Internality and Age

Degree of Internality	15-35 years	36-50 years	51-65 years	Over 65 years
Low	-.166	-.153	.105	.214

As indicated in the interaction tables, rural residents and nonbelievers in general, and those 51 years of age and over, have higher probabilities of opposing this regulation. In addition, rural respondents and those over 51 years of age have higher probabilities of being more external than younger urban residents.

$H_0 2$: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Require home thermostats to be no lower than 78°F in summer."

Three two-way interaction tables were included in the final model for this regulation (goodness of fit = .3509): (1) relationship between opposition to the regulation and belief in the energy problem (Table 24), (2) relationship between age and belief in the energy problem (Table 25), and (3) relationship between age and degree of internality (Table 26).

Table 24.
Two-Way Interaction and Lambda Coefficients for the regulation "Require home thermostats to be no lower than 78°F in summer" and Belief in the Energy Problem

Regulation	Nonbelievers
Oppose	.204

Table 25.
Two-Way Interaction and Lambda Coefficients for
Belief in the Energy Problem and Age

Energy Problem	15-35 years	36-50 years	61-65 years	Over 65 years
Nonbelievers	-.298	.-204	.136	.366

Table 26.
Two-Way Interaction and Lambda Coefficients for
Degree of Internality and Age

Degree of Internality	15-35 years	36-50 years	51-65 years	Over 65 years
Low	-.173	-.223	.117	.279

Respondents that were 51 years or older had a high probability of not believing in the energy problem. Those respondents 51 years of age and older also have high probabilities of being more external. This is consistent with the previous regulation. The null hypothesis was rejected at the $p \leq .10$ significance level.

$H_0 3$: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Require everyone's home to pass an energy 'audit' (must have adequate insulation, double-pane or storm windows, etc.)"

The interactions included in the final model were (1) opposition to the regulation and belief in the energy problem (Table 27), and (2) opposition to the regulation and tenure (Table 28). Goodness of fit for these models was .4754. The null hypothesis was rejected at the $p \leq$

.10 significance level. Relationships found included high probabilities for nonbelievers to oppose the regulation, and high probabilities for homeowners to oppose the regulation.

Table 27.
Two-Way Interaction and Lambda Coefficients for the regulation "Require everyone's home to pass an energy audit" and Belief in the Energy Problem

Regulation	Nonbelievers
Oppose	.235

Table 28.
Two-Way Interactions and Lambda Coefficients for the regulation "Require everyone's home to pass an energy audit" and Tenure

Regulation	Homeowners
Oppose	.190

$H_0$4: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Require utility companies to charge highest rates to high users."

The interactions included in the final model for this regulation were (1) age and belief in the energy problem (Table 29), (2) age and opposition to the regulation (Table 30), and (3) age and degree of internality (Table 31). The goodness of fit for these models was .7313; the null hypothesis was rejected at the $p \leq .10$ significance level.

As in the previous log-linear models, a higher probability existed for nonbelievers to be 51 years or older, and for this age group to oppose the regulation. Additionally and consistently, those 51 and older have a higher probability of scoring low in terms of internality.

Table 29.
Two-Way Interaction and Lambda Coefficients for Belief in the Energy Problem and Age

Energy Problem	15-35 years	36-50 years	51-65 years	Over 65 years
Nonbelievers	-.369	-.142	.137	.375

Table 30.
Two-Way Interaction and Lambda Coefficients for the regulation "Require utility companies to charge highest rates to high users and lowest rates to low users" and Age

Regulation	15-35 years	36-50 years	51-65 years	Over 65 years
Oppose	-.156	-.082	.238	-.000

Table 31.
Two-Way Interaction and Lambda Coefficients for Degree of Internality and Age

Degree of Internality	15-35 years	36-50 years	51-65 years	Over 65 years
Low	-.173	-.218	.125	.266

$H_0 5$: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Discourage building homes away from towns and cities to lessen travel by car."

Five two-way interactions were included in the best fit (1.0000) model for this regulation: (1) opposition to the regulation and rural/urban residency (Table 32), (2) sex and belief in the energy problem (Table 33), (3) opposition to the regulation and education (Table 34), (4) sex and tenure (Table 35), and (5) degree of internality and education (Table 36).

Rural residents have higher probabilities of opposing this regulation. Opposition is also more probable for those respondents who have education of less than a college degree. Males are more likely not to believe there is an energy problem, and they are more likely to be homeowners. Finally, those respondents with less than a college degree in terms of educational level, have a higher probability of having a low degree of internality. The null hypothesis was rejected at the $p \leq .10$ significance level.

Table 32.
Two-Way Interaction and Lambda Coefficients for the regulation "Discourage building homes away from towns and cities to lessen travel by car" and Rural/Urban Residency

Regulation	Rural Residency
Oppose	.209

Table 33.
Two-Way Interaction and Lambda Coefficient for
Sex and Belief in the Energy Problem

Sex	Nonbelievers
Males	.276

Table 34.
Two-Way Interaction and Lambda Coefficients for
the regulation "Discourage building homes away from towns
and cities to lessen travel by car" and Education

Regulation	0-8 grades/ some high school	high school graduate	trade school/ some college	college graduate	graduate work/ graduate degree
Oppose	.001	.308	.251	-.260	-.310

Table 35.
Two-Way Interaction and Lambda Coefficients for
Sex and Tenure

Sex	Homeowners
Males	.207

Table 36.
Two-Way Interaction and Lambda Coefficients for
Degree of Internality and Education

Degree of Internality	0-8 grades/ some high school	high school graduate	trade school/ some college	college graduate	graduate work/ graduate degree
Low	.423	.297	.020	-.285	-.454

$H_0 6$: There is no relationship between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation "Change building codes and mortgage requirements to encourage new types of energy-saving housing."

No interactions came into the final model for this regulation. The goodness of fit test was extremely low (.0043). The null hypothesis was accepted at the $p \leq .10$ significance level.

$H_0 7$: There is no relationships between degree of internality, belief in the seriousness of the energy problem, and favorability toward the regulation, "Require land developers to have energy plans as part of their developments."

Three two-way interaction models were included in the final model: (1) the relationship between opposition to the regulation and belief in the energy problem (Table 37), (2) relationship between opposition to the regulation and sex (Table 38), and (3) degree of internality and sex (Table 39). The goodness of fit was low (.2927).

This regulation presents a couple of differences over previous models. Believers, rather than nonbelievers, have a higher probability of opposing, and males have a higher probability of opposing. Females have a higher probability of being more external, which supports the normative data for the I-E construct. The null hypothesis was rejected at the $p \leq .10$ significance level.

Table 37.
Two-Way Interaction and Lambda Coefficient for the regulation "Require land developers to have energy plans as part of their developments" and Belief in the Energy Problem

Regulation	Nonbelievers
Oppose	-.472

Table 38.
Two-Way Interaction and Lambda Coefficient for the regulation "Require land developers to have energy plans as part of their developments" and Sex

Regulation	Females
Oppose	-.213

Table 39.
Two-Way Interaction and Lambda Coefficient for Degree of Internality and Sex

Degree of Internality	Males
Low	-.078

The Kendall Tau Coefficient

The Kendall Tau Coefficient tested the degree of association between the Delphi Panel's ranking of seven potentially restrictive energy conservation regulations, and 33 variables, each ranked on the basis of percentage of opposition (most opposed=1). The 33 variables included: nonbelievers in an energy problem, believers in an energy problem, low degree of internality, high degree of internality, income less than $9,999, income of $10,000-$19,999, income of $20,000-$29,999, income of $30,000-$39,999, income of $40,000-$49,999, income greater than $50,000, 0-8 grades/some high school, high school graduate, trade school/some college, college degree, graduate work/degree, rural residents, urban residents, 0-35 years of age, 36-50 years of age, 51-65 years of age, 65 years of age and older, renters, homeowners, married/separated, widowed, divorced, never married, mobile homes/trailers, a single family house detached from any other house, building for two to four households, building for five or more households, males, and females.

$H_0 8$: There is no association between the degree of restrictiveness of seven potentially restrictive energy conservation regulations and acceptance of the most restrictive regulations by believers and nonbelievers in the energy problem

The null hypothesis was accepted at the $p \leq .10$ significance level. The Kendall tau for association between the Delphi Panel ranking and nonbelievers in an energy problem was .2381 (p=.2810) (Table 40), and for association between the Delphi Panel ranking and believers in an energy problem was .4286 (p=.1194) (Table 41). Both Kendall taus indicated a low degree of association.

$H_0 9$: There is no association between the degree of restrictiveness of seven potentially restrictive energy conservation regulations and acceptance of the most restrictive regulations by respondents with low and high degrees of internality

Table 40.
Ranking for Kendall Tau
Variable - Nonbelievers in an Energy Problem

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	1.0%	5.0%	n= 42	1
2. Require home thermostats to be no higher than 65°F in winter	1.1%	5.0%	n= 44	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	3.0%	1.9%	n= 36	6
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	4.1%	2.1%	n= 44	7
5. Discourage building homes away from towns and cities to lessen travel by car	1.1%	5.8%	n= 44	2
6. Require home thermostats to be no lower than 78°F in summer	2.2%	3.5%	n= 39	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	2.9%	2.9%	n= 38	5

$\tau = .2381$
$p = .2810$

Table 41.
Ranking for Kendall Tau
Variable - Believers in an Energy Problem

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	39.8%	54.2%	n=657	3
2. Require home thermostats to be no higher than 65°F in winter	31.0%	62.9%	n=673	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	85.5%	9.6%	n=694	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	64.8%	29.0%	n=663	5
5. Discourage building homes away from towns and cities to lessen travel by car	16.3%	76.8%	n=593	1
6. Require home thermostats to be no lower than 78°F in summer	53.6%	40.7%	n=642	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	80.7%	13.5%	n=623	6

τ = .1194
p = .4286

The null hypothesis was accepted at the $p \leq .10$ significance level. The Kendall tau for association between the Delphi Panel ranking and respondents with low internality scores was .4286 (p=.1194) (Table 42), and for association between the Delphi Panel ranking and respondents with high internality scores was .4286 (p=.1194) (Table 43). Both Kendall taus indicated a low degree of association.

$H_0$10: There is no association between the degree of restrictiveness of seven potentially restrictive energy conservation regulations and acceptance of the most restrictive regulations based on any of the eight socio-demographic variables: income, education, urban/rural residency, age, tenure, marital status, type of dwelling, or sex.

Income. The null hypothesis was accepted at the $p \leq .10$ significance level. All of the Kendall taus for the income variables were low, indicating poor association. The Kendall taus were as follows: .3333 (p=.1907) for income less than $9,999; .1429 (p=.3863) for income of $10,000-$19,999; .1429 (p=.3863) for income of $20,000-$29,999; .2381 (p=.2810) for income of $30,000-$39,999; .1429 (p=.3863) for income of $40,000-$49,999; and .2381 (p=.2810) for income greater than $50,000 (see Tables 44 through 49).

Education. The Kendall tau for all levels of education, when tested for association with the Delphi Panel ranking, was .1429 (p=.3863). This indicates a low degree of association. The null hypothesis was accepted at the $p \leq .10$ significance level (see Tables 50 through 54).

Rural/Urban Residency. Both rural and urban residents, when tested for association with the Delphi Panel ranking, had Kendall taus

Table 42.
Ranking for Kendall Tau
Variable - Low Degree of Internality

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	19.6%	27.0%	n=296	3
2. Require home thermostats to be no higher than 65°F in winter	14.7%	32.8%	n=285	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	40.3%	5.8%	n=278	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	33.1%	15.1%	n=284	5
5. Discourage building homes away from towns and cities to lessen travel by car	7.5%	37.6%	n=241	1
6. Require home thermostats to be no lower than 78°F in summer	25.7%	22.0%	n=269	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	39.3%	6.7%	n=254	6

$\tau = .1194$
$p = .4285$

Table 43.
Ranking for Kendall Tau
Variable - High Degree of Internality

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	21.6%	31.8%	n=309	3
2. Require home thermostats to be no higher than 65°F in winter	18.3%	34.2%	n=315	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	48.6%	5.3%	n=325	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	36.9%	14.9%	n=305	5
5. Discourage building homes away from towns and cities to lessen travel by car	9.9%	44.5%	n=293	1
6. Require home thermostats to be no lower than 78°F in summer	30.0%	22.3%	n=295	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	45.7%	8.3%	n=298	6

$\tau = .1429$
$p = .3863$

Table 44.
Ranking for Kendall Tau
Variable - Income of Less than $9,999

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	6.2%	7.8%	n= 95	3
2. Require home thermostats to be no higher than 65°F in winter	5.5%	9.5%	n=104	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	12.2%	1.8%	n= 99	5
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	12.5%	4.1%	n=113	6
5. Discourage building homes away from towns and cities to lessen travel by car	2.4%	12.0%	n= 89	1
6. Require home thermostats to be no lower than 78°F in summer	9.5%	5.4%	n= 99	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	13.3%	2.0%	n= 98	7

τ = .1907
p = .3333

Table 45.
Ranking for Kendall Tau
Variable - Income of $10,000-$19,999

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	10.8%	14.2%	n=169	3
2. Require home thermostats to be no higher than 65°F in winter	7.8%	17.7%	n=178	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	22.3%	3.1%	n=179	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	16.6%	8.5%	n=171	5
5. Discourage building homes away from towns and cities to lessen travel by car	3.7%	22.6%	n=162	1
6. Require home thermostats to be no lower than 78°F in summer	14.6%	9.6%	n=161	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	20.4%	4.4%	n=158	6

τ = .3863
p = .1429

Table 46.
Ranking for Kendall Tau
Variable - Income of $20,000-$29,999

	Respondents			
Regulation (in Delphi Panel ranking)	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	11.4%	16.4%	n=188	3
2. Require home thermostats to be no higher than 65°F in winter	8.2%	18.6%	n=186	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	23.7%	2.6%	n=185	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	18.2%	7.0%	n=172	5
5. Discourage building homes away from towns and cities to lessen travel by car	4.9%	21.2%	n=161	1
6. Require home thermostats to be no lower than 78°F in summer	13.9%	13.1%	n=179	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	21.0%	3.3%	n=155	6

τ = .3863
p = .1429

Table 47.
Ranking for Kendall Tau
Variable - Income of $30,000-$39,999

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	7.2%	10.1%	n=116	3
2. Require home thermostats to be no higher than 65°F in winter	4.6%	11.7%	n=113	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	14.8%	1.6%	n=115	6
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	12.2%	4.8%	n=116	5
5. Discourage building homes away from towns and cities to lessen travel by car	2.9%	13.8%	n=103	1
6. Require home thermostats to be no lower than 78°F in summer	9.5%	7.1%	n=110	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	15.1%	3.0%	n=115	7

τ = .2381
p = .2810

Table 48.
Ranking for Kendall Tau
Variable - Income of $40,000-$49,999

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	3.8%	4.1%	n= 54	3
2. Require home thermostats to be no higher than 65°F in winter	3.2%	5.2%	n= 58	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	8.0%	0.7%	n= 61	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	5.5%	2.1%	n= 51	5
5. Discourage building homes away from towns and cities to lessen travel by car	2.3%	6.0%	n= 51	1
6. Require home thermostats to be no lower than 78°F in summer	4.1%	4.7%	n= 58	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	6.8%	1.7%	n= 54	6

τ = .1429
p = .3363

Table 49.
Ranking for Kendall Tau
Variable - Income greater than $50,000

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	3.0%	5.0%	n= 54	2
2. Require home thermostats to be no higher than 65°F in winter	3.0%	5.0%	n= 56	3
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	8.0%	1.2%	n= 65	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	5.1%	3.4%	n= 58	5
5. Discourage building homes away from towns and cities to lessen travel by car	2.0%	6.2%	n= 50	1
6. Require home thermostats to be no lower than 78°F in summer	4.7%	3.8%	n= 57	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	7.4%	1.6%	n= 57	6

$\tau = .2381$
$p = .2810$

Table 50.
Ranking for Kendall Tau
Variable - 0-8 Grades/Some High School

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	5.0%	8.7%	n= 96	3
2. Require home thermostats to be no higher than 65°F in winter	4.0%	8.9%	n= 94	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	10.9%	1.6%	n= 91	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	9.2%	4.2%	n= 95	5
5. Discourage building homes away from towns and cities to lessen travel by car	2.1%	11.1%	n= 84	1
6. Require home thermostats to be no lower than 78°F in summer	7.1%	5.4%	n= 86	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	9.2%	2.3%	n= 76	6

$\tau = .1429$
$p = .3363$

Table 51.
Ranking for Kendall Tau
Variable - High School Graduate

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	9.8%	13.8%	n=166	3
2. Require home thermostats to be no higher than 65°F in winter	6.2%	17.0%	n=169	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	20.3%	3.4%	n=175	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	17.1%	8.6%	n=182	5
5. Discourage building homes away from towns and cities to lessen travel by car	2.3%	22.7%	n=161	1
6. Require home thermostats to be no lower than 78°F in summer	12.6%	10.7%	n=161	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	18.8%	4.2%	n=153	6

$\tau = .1429$
$p = .3863$

Table 52.
Ranking for Kendall Tau
Variable - Trade School/Some College

Regulation (in Delphi Panel ranking)	Respondents Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	14.7%	19.3%	n=239	3
2. Require home thermostats to be no higher than 65°F in winter	10.9%	23.7%	n=151	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	30.8%	3.6%	n=251	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	21.9%	10.1%	n=225	5
5. Discourage building homes away from towns and cities to lessen travel by car	4.8%	28.5%	n=214	1
6. Require home thermostats to be no lower than 78°F in summer	19.1%	15.1%	n=236	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	29.9%	4.2%	n=227	6

$\tau = .1429$
$p = .3863$

Table 53.
Ranking for Kendall Tau
Variable - College Graduate

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	4.6%	6.4%	n= 77	3
2. Require home thermostats to be no higher than 65°F in winter	4.0%	7.5%	n= 84	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	10.8%	1.1%	n= 88	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	8.3%	2.9%	n= 80	5
5. Discourage building homes away from towns and cities to lessen travel by car	3.1%	8.6%	n= 75	1
6. Require home thermostats to be no lower than 78°F in summer	7.2%	4.5%	n= 81	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	10.5%	2.1%	n= 84	6

τ = .1429
p = .3863

Table 54.
Ranking for Kendall Tau
Variable - Graduate Work/Degree

	Respondents			
Regulation (in Delphi Panel ranking)	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	7.5%	10.2%	n=125	3
2. Require home thermostats to be no higher than 65°F in winter	6.5%	11.3%	n=129	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	16.5%	1.0%	n=129	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	13.0%	4.7%	n=126	5
5. Discourage building homes away from towns and cities to lessen travel by car	5.3%	11.5%	n=108	1
6. Require home thermostats to be no lower than 78°F in summer	9.6%	8.7%	n=126	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	15.5%	3.3%	n=125	6

τ = .1429
p = .3863

of .1429 (p=.3863). This is a low degree of association and the null hypothesis was accepted at the $p \leq .10$ significance level (see Tables 55 and 56).

<u>Age</u>. When the age variable was tested for association between the Delphi Panel ranking and all four age categories, association was low. The Kendall tau for those 15-35 years was .1429 (p=.3863); for those 36-50, .1429 (p=.3863); for the 51-65 age group, .2381 (p= .2810); and for those 65 years of age and older, .1429 (p=.3863). The null hypothesis was accepted at the $p \leq .10$ significance level (see Tables 57 through 60).

<u>Tenure</u>. The Kendall tau was low for both renters and homeowners when tested for association with the Delphi Panel ranking with scores of .1429 (p=.3863) each. The null hypothesis was accepted at the $p \leq .10$ significance level (see Tables 61 and 62).

<u>Marital Status</u>. Those respondents that were married, separated, or widowed, had Kendall taus of .1429 (p=.3863) when tested for association with the Delphi Panel ranking. Divorced and never married respondents had Kendall taus of .3333 (p=.1907). All marital status categories had low degrees of association. The null hypothesis was accepted at the $p \leq .10$ significance level (see Tables 63 through 66).

<u>Type of Dwelling</u>. The null hypothesis was accepted at the $p \leq .10$ significance level. Degree of association was low for all dwelling categories. Those respondents living in mobile homes/trailers had a Kendall tau of .2381 (p=.2810); those respondents living in a single

Table 55.
Ranking for Kendall Tau
Variable - Rural Residents

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	19.0%	29.3%	n=354	3
2. Require home thermostats to be no higher than 65°F in winter	13.5%	34.7%	n=364	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	41.2%	6.5%	n=363	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	33.2%	15.1%	n=357	5
5. Discourage building homes away from towns and cities to lessen travel by car	6.4%	45.4%	n=346	1
6. Require home thermostats to be no lower than 78°F in summer	26.9%	21.0%	n=340	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	39.0%	8.0%	n=325	6

τ = .1429
p = .3863

Table 56.
Ranking for Kendall Tau
Variable - Urban Residents

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	22.0%	29.7%	n=377	3
2. Require home thermostats to be no higher than 65°F in winter	18.6%	33.2%	n=389	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	47.5%	4.8%	n=398	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	36.5%	15.2%	n=384	5
5. Discourage building homes away from towns and cities to lessen travel by car	11.8%	36.4%	n=322	1
6. Require home thermostats to be no lower than 78°F in summer	29.0%	23.1%	n=373	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	45.5%	7.5%	n=367	6

$\tau = .1429$
$p = .3863$

Table 57.
Ranking for Kendall Tau
Variable - 0-35 Years of Age

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	13.2%	14.1%	n=188	3
2. Require home thermostats to be no higher than 65°F in winter	11.1%	17.2%	n=201	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	26.5%	2.2%	n=206	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	22.1%	6.1%	n=195	5
5. Discourage building homes away from towns and cities to lessen travel by car	4.8%	24.5%	n=184	1
6. Require home thermostats to be no lower than 78°F in summer	15.9%	13.3%	n=197	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	25.4%	3.5%	n=188	6

$\tau = .1429$
$p = .3863$

Table 58.
Ranking for Kendall Tau
Variable - 36-50 Years of Age

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	10.3%	16.4%	n=184	3
2. Require home thermostats to be no higher than 65°F in winter	7.2%	18.7%	n=184	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	23.8%	3.6%	n=196	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	19.7%	7.5%	n=188	5
5. Discourage building homes away from towns and cities to lessen travel by car	5.2%	23.2%	n=179	1
6. Require home thermostats to be no lower than 78°F in summer	13.0%	13.5%	n=179	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	21.3%	5.2%	n=172	6

$\tau = .1429$
$p = .3863$

Table 59.
Ranking for Kendall Tau
Variable - 51-65 Years of Age

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	10.9%	17.0%	n=192	3
2. Require home thermostats to be no higher than 65°F in winter	8.3%	19.6%	n=198	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	23.4%	3.9%	n=196	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	15.9%	11.6%	n=190	4
5. Discourage building homes away from towns and cities to lessen travel by car	5.7%	22.0%	n=174	1
6. Require home thermostats to be no lower than 78°F in summer	16.6%	11.3%	n=188	5
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	23.3%	4.3%	n=179	6

$\tau = .2381$
$p = .2810$

Table 60.
Ranking for Kendall Tau
Variable - 65 Years of Age and Older

Regulation (in Delphi Panel ranking)	Respondents Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	7.1%	11.0%	n=124	3
2. Require home thermostats to be no higher than 65°F in winter	4.6%	13.3%	n=127	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	15.7%	0.9%	n=120	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	11.8%	5.3%	n=119	5
5. Discourage building homes away from towns and cities to lessen travel by car	2.5%	12.1%	n= 92	1
6. Require home thermostats to be no lower than 78°F in summer	10.4%	6.0%	n=111	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	13.9%	3.1%	n=110	6

$\tau = .1429$
$p = .3863$

Table 61.
Ranking for Kendall Tau
Variable - Renters

Regulation (in Delphi Panel ranking)	Respondents Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	7.0%	5.6%	n= 91	4
2. Require home thermostats to be no higher than 65°F in winter	5.0%	8.8%	n= 90	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	12.3%	0.8%	n= 96	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	11.2%	3.0%	n=101	5
5. Discourage building homes away from towns and cities to lessen travel by car	3.3%	10.0%	n= 86	1
6. Require home thermostats to be no lower than 78°F in summer	7.4%	6.8%	n= 98	3
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	11.7%	1.6%	n= 89	6

$\tau = .0476$
$p = .5000$

Table 62.
Ranking for Kendall Tau
Variable - Homeowners

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	34.0%	53.4%	n=616	3
2. Require home thermostats to be no higher than 65°F in winter	26.7%	59.5%	n=624	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	76.7%	10.2%	n=640	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	58.7%	27.1%	n=612	5
5. Discourage building homes away from towns and cities to lessen travel by car	14.9%	71.8%	n=560	1
6. Require home thermostats to be no lower than 78°F in summer	48.6%	37.2%	n=591	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	72.2%	14.5%	n=579	6

$\tau = .1429$
$p = .3863$

Table 63.
Ranking for Kendall Tau
Variable - Married/Separated

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	30.5%	45.1%	n=536	3
2. Require home thermostats to be no higher than 65°F in winter	22.3%	52.0%	n=442	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	67.5%	8.3%	n=560	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	50.6%	24.0%	n=533	5
5. Discourage building homes away from towns and cities to lessen travel by car	12.3%	64.0%	n=495	1
6. Require home thermostats to be no lower than 78°F in summer	41.9%	32.9%	n=520	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	62.6%	13.1%	n=508	6

τ = .1429
p = .3863

Table 64.
Ranking for Kendall Tau
Variable - Widowed

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	4.1%	5.6%	n= 69	3
2. Require home thermostats to be no higher than 65°F in winter	3.4%	6.9%	n= 76	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	8.4%	1.2%	n= 71	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	6.4%	3.5%	n= 81	5
5. Discourage building homes away from towns and cities to lessen travel by car	0.9%	7.4%	n= 54	1
6. Require home thermostats to be no lower than 78°F in summer	5.6%	4.3%	n= 69	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	7.7%	1.1%	n= 59	6

$\tau = .1429$
$p = .3863$

Table 65.
Ranking for Kendall Tau
Variable - Divorced

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	3.1%	4.5%	n= 54	3
2. Require home thermostats to be no higher than 65°F in winter	3.7%	4.7%	n= 62	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	6.8%	0.6%	n= 55	6
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	6.0%	1.7%	n= 55	5
5. Discourage building homes away from towns and cities to lessen travel by car	2.5%	5.9%	n= 54	1
6. Require home thermostats to be no lower than 78°F in summer	4.2%	3.5%	n= 53	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	7.0%	1.1%	n= 54	7

τ = .3333
p = .1907

Table 66.
Ranking for Kendall Tau
Variable - Never Married

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	3.7%	3.4%	n= 50	4
2. Require home thermostats to be no higher than 65°F in winter	1.9%	5.1%	n= 51	1
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	6.5%	0.7%	n= 53	6
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	6.3%	1.5%	n= 56	5
5. Discourage building homes away from towns and cities to lessen travel by car	2.2%	4.8%	n= 45	2
6. Require home thermostats to be no lower than 78°F in summer	3.9%	3.7%	n= 53	3
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	6.7%	0.7%	n= 50	7

$\tau = .3333$
$p = .1907$

family house detached from any other house had a Kendall tau of .1429 ($p=.3863$); those respondents living in buildings for two to four households had a Kendall tau of .0476 ($p=.5000$); and those respondents living in buildings for five or more households had a Kendall tau of .3333 ($p=.1907$) (see Tables 67 through 70).

Sex. Both males and females had Kendall taus of .1429 ($p=.3863$) indicating a low degree of association between sex and the Delphi Panel ranking. The null hypothesis was accepted at the $p \leq .10$ significance level (see Tables 71 and 72).

Kendall's Coefficient of Concordance

Kendall's Coefficient of Concordance was utilized to test for agreement among the Delphi Panel members. Panel member rankings were tabulated for each regulation and Kendall's W statistic was computed (see page 61 for explanation of formula).

$$W = \frac{\text{variance of rank sums}}{\text{maximum possible variance of rank sums}},$$

where

$$W = \frac{11\Sigma_j T_j^2}{m^2 N(N^2-1)} - \frac{3(N+1)}{N-1}.$$

The sum of the regulation was 1321 (see Appendix E). To calculate T,

$$T = \frac{m(N)(N+1)}{2} - \frac{20(11)(11+1)}{2} = 1320$$

where m = number of panel members and N = number of regulations.

Table 67.
Ranking for Kendall Tau
Variable - Mobile Homes/Trailers

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	3.8%	5.7%	n= 67	3
2. Require home thermostats to be no higher than 65°F in winter	2.7%	7.1%	n= 72	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	7.7%	1.8%	n= 68	6
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	6.3%	3.7%	n= 71	5
5. Discourage building homes away from towns and cities to lessen travel by car	1.2%	8.9%	n= 65	1
6. Require home thermostats to be no lower than 78°F in summer	4.8%	4.8%	n= 66	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	8.1%	1.2%	n= 62	7

$\tau = .2381$
$p = .2810$

Table 68.
Ranking for Kendall Tau
Variable - A Single Family House Detached From Any Other House

Regulation (in Delphi Panel ranking)	Respondents Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	32.1%	49.0%	n=571	3
2. Require home thermostats to be no higher than 65°F in winter	25.8%	54.7%	n=586	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	73.4%	8.6%	n=601	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	55.3%	24.8%	n=569	5
5. Discourage building homes away from towns and cities to lessen travel by car	14.1%	67.0%	n=521	1
6. Require home thermostats to be no lower than 78°F in summer	45.0%	35.0%	n=553	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	67.7%	13.8%	n=542	6

$\tau = .1429$
$p = .3863$

Table 69.
Ranking for Kendall Tau
Variable - Building for Two to Four Households

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	3.0%	2.7%	n= 40	4
2. Require home thermostats to be no higher than 65°F in winter	1.8%	4.3%	n= 44	1
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	4.8%	0.7%	n= 40	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	4.4%	2.0%	n= 43	5
5. Discourage building homes away from towns and cities to lessen travel by car	1.4%	4.0%	n= 35	2
6. Require home thermostats to be no lower than 78°F in summer	2.9%	3.3%	n= 41	3
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	4.4%	1.1%	n= 36	6

$\tau = .0476$
$p = .5000$

Table 70.
Ranking for Kendall Tau
Variable - Building for Five or More Households

Regulation (in Delphi Panel ranking)	Respondents Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	1.6%	2.1%	n= 25	2
2. Require home thermostats to be no higher than 65°F in winter	1.6%	2.0%	n= 26	3
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	3.6%	0.3%	n= 27	6
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	3.4%	0.8%	n= 28	5
5. Discourage building homes away from towns and cities to lessen travel by car	1.1%	2.3%	n= 22	1
6. Require home thermostats to be no lower than 78°F in summer	2.6%	1.6%	n= 27	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	3.6%	0.1%	n= 25	7

$\tau = .3333$
$p = .1907$

Table 71.
Ranking for Kendall Tau
Variable - Males

Regulation (in Delphi Panel ranking)	Respondents: Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	24.1%	35.4%	n=412	3
2. Require home thermostats to be no higher than 65°F in winter	17.5%	39.3%	n=405	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	51.2%	6.1%	n=414	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	39.3%	18.1%	n=401	5
5. Discourage building homes away from towns and cities to lessen travel by car	12.2%	45.4%	n=365	1
6. Require home thermostats to be no lower than 78°F in summer	30.6%	25.9%	n=384	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	46.5%	11.9%	n=383	6

$\tau = .1429$
$p = .3863$

Table 72.
Ranking for Kendall Tau
Variable - Females

Regulation (in Delphi Panel ranking)	Respondents			
	Favor	Oppose	Sample Size	Ranking based on percentage of opposition
1. Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	17.1%	23.4%	n=280	3
2. Require home thermostats to be no higher than 65°F in winter	13.9%	29.3%	n=308	2
3. Change building codes and mortgage requirements to encourage new types of energy-saving housing	38.0%	4.7%	n=309	7
4. Require utility companies to charge lowest rates to low energy users and highest rates to high users	29.8%	12.8%	n=297	5
5. Discourage building homes away from towns and cities to lessen travel by car	5.8%	36.6%	n=269	1
6. Require home thermostats to be no lower than 78°F in summer	25.1%	18.4%	n=269	4
7. Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	37.3%	4.3%	n=273	6

$\tau = .1429$
$p = .3363$

To calculate Kendall's W statistic,

$$W = \frac{11\ (53)^2 + (113)^2 + (30)^2 + (185)^2 + (179)^2 + (85)2 + (103)2 + (88)^2 + (193)^2 + (166)^2 + (126)^2}{20^2(11)(11^2-1)}$$

$$- \frac{3(11+1)}{11-1} = \frac{11(189003)}{528000} - 3.6 = 3.94-3.6 = .34$$

There was a low degree of concordance among the Delphi Panel members since the variance of the rank sums was only 34 percent of the maximum possible.

CHAPTER V

DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

The purpose of this study was to understand consumer attitudes toward potentially restrictive (mandatory) energy conservation regulations. Three variables, belief in the seriousness of the energy problem, a psychological measure of internal control (internality), and socio-demographic characteristics were examined in relation to consumer attitudes toward these regulations. The data were taken from a larger longitudinal data base obtained by the Western Regional Agricultural Experiment Station Technical Committee (W-159) "Consequences of Energy Conservation Policies for Western Region Households." Only the 1983 Oregon sample were used for analyses in this study.

The seven potentially restrictive energy conservation regulations were ranked according to the degree of restrictiveness of consumers by an expert Delphi Panel. The panel members were instructed to base their decision about the energy conservation regulations on a predetermined definition of mandatory. Mandatory was defined in this study as outer-imposed laws or policies that would restrict, or limit, personal choice and behavior of members of society in an effort to reduce the amount of energy consumed. Eleven regulations were ranked, but only the seven most restrictive regulations were chosen for analyses in this study. A summary of significant socio-demographic variables predicting opposition to the regulations, based on logistic regression analysis and log-linear analysis, is shown in Tables 73 and 74.

The statistical analysis utilized in this study to test for associations between the Delphi Panel ranking and all of the variables (33 total) was the Kendall Tau Coefficient. The purpose of the Delphi Panel was to find out whether there were differences between policymakers' perception of restrictive regulations on households, and how respondents ranked the regulations (based on percentages of opposition). There were differences. All 33 of the associations were low, which means there was a low association among the rankings.

It is difficult to make too many observations at this point, however. Respondents in the study were not given the same definition or assumptions about mandatory energy conservation regulations as the Delphi Panel received, and there was a low degree of concordance (agreement) among the Delphi Panel itself as to the ranking of the regulations. It should be pointed out though, that due to the poor associations, perhaps what policymakers perceive to be restrictive to households may in fact be acceptable, and vice versa.

The regulation ranked by the Delphi Panel as the most restrictive was "Require everyone's home to pass an energy audit." This regulation was opposed by 59.1 percent of the respondents. Tenure was the only significant (p=.0019) socio-demographic predictor from the logistic regression analysis for this regulation. Homeowners were more likely to oppose this regulation than renters were likely to

Table 73.
Summary of Significant Socio-Demographic Variables
From Logistic Regression Analysis

Regulation	Significant Variables Predicting Opposition[a]
Require home thermostats to be no than 65°F in winter	Rural residents higher ($p=.0264$); Age (36 years and over) ($p=.0405$)
Require home thermostats to be no lower than 78°F in summer	Age (15-50 years) ($p=.0919$)
Require everyone's home to pass an energy audit	Tenure (homeowners) ($p=.0019$)
Require utility companies to charge lowest rates to low users and highest rates to high users	Age (51 years and older) ($p=.0002$)
Discourage building homes away from towns and cities to lessen travel by car	Rural homeowners; ($p=.0210$) Females with less than a college degree (except for high school graduates) ($p=.0510$)
Change building codes and mortgage requirements to encourage new types of energy-saving housing	Age (36-65 years) ($p=.0609$)
Require land developers to have energy plans as part of their developments	Sex (males) ($p=.0009$)

[a]The BMDP statistical package allowed the variables with $p \leq .10$ or lower to be included in the final model.

Table 74.
Summary of Significant Relationships From Log-Linear Analysis

Regulation	Significant Relationships[a]
Require home thermostats to be no higher than 65°F in winter	1. Opposition and rural residents ($p=.0360$) 2. Opposition and nonbelievers ($p=.0348$) 3. Nonbelievers and age (51 and older) ($p=.0578$) 4. Low internality and rural residents ($p=.0359$) 5. Low internality and age (51 and older) ($p=.0042$)
Require home thermostats to be no lower than 78°F in summer	1. Opposition and nonbelievers ($p=.0212$) 2. Nonbelievers and age (51 and older) ($p=.0426$) 3. Low internality and age (51 and older) ($p=.0003$)
Require everyone's home to pass an energy audit	1. Opposition and nonbelievers ($p=.0237$) 2. Opposition and homeowners ($p=.0026$)
Require utility companies to charge lowest rates to low energy users and highest rates to high users	1. Nonbelievers and age (51 and older) ($p=.0288$) 2. Opposition and age (51-65 years) ($p=.0116$) 3. Low internality and age (51 and older) ($p=.0004$)
Discourage building homes away from towns and cities to lessen travel by car	1. Opposition and rural residents ($p=.0028$) 2. Sex (males) and nonbelievers ($p=.0032$) 3. Opposition and education ($<$ college degree) ($p=.0009$) 4. Sex (males) and homeowners ($p=.0011$) 5. Low internality and education (college degree) ($p=.0000$)
Change building codes and mortgage requirements to encourage new types of energy-saving housing	There were no interactions
Require land developers to have energy plans as part of their developments	1. Opposition and believers ($p=.0000$) 2. Opposition and sex (males) ($p=.0067$) 3. Low internality and sex (females) ($p=.0933$)

[a]The BMDP Statistical package allowed all variables with $p \leq .10$ or lower to be included in the final model.

oppose this regulation. Significant relationships identified in the log-linear analysis included homeowners and opposition to the regulation (p=.0026) and nonbelievers and opposition to the regulation (p=.0237). No other variables had a significant effect in either analysis.

This is not surprising since this regulation has potential economic (financial) consequences for all households. However, renters stand to gain more energy efficient dwellings at no direct cost as a result of this regulation. This is also supported in the research reported by Buck (1982). This may indicate that homeowners, regardless of other characteristics, oppose such a regulation. The economic and time consuming consequences of this regulation may be more than homeowners feel they could afford.

The second most restrictive regulation, as ranked by the Delphi Panel, was to "Require home thermostats to be no higher than 65°F in winter." More respondents (67.9%) opposed this regulation than the previous one. Rural resident (p=.0264) was a significant variable in both the logistic regression analysis and the log-linear model (p=.0360). Rural residents who do not live in close proximity to other individuals may not see a common need to reduce energy use by lowering the temperature. Those respondents 36 years of age and older were significantly opposed (p=.0405) to this regulation in the logistic regression analysis. Health concerns by older people about hypothermia may help explain this result.

The other regulation concerning home heating temperatures was "Require home thermostats to be no lower than 78°F in summer." This regulation was ranked sixth by the Delphi Panel and opposed by 44.1 percent of the respondents. Respondents 50 years of age and younger had a significant (p=.0919) socio-demographic effect in the logistic regression model. This age group is more apt to be employed and thus feel they can afford to maintain a cooler home in the summer. There were no socio-demographic variables in the log-linear analysis that interacted significantly in opposition to this regulation.

The regulation, "Require utility companies to charge lowest rates to low energy users and highest rates to high users," is closely related to heating and cooling utility bills. It was opposed by 30.3 percent of the respondents. The Delphi Panel ranked this regulation fourth in terms of restrictiveness for the average household. Respondents who were older than 50 years were a significant (p=.0002) variable in the logistic regression analysis. Respondents 51 to 65 years of age were significant (p=.0116) in the log-linear model. This age group represents increasing numbers of retirees and, therefore, may feel more cautious of higher energy bills both in terms of needing heat in their homes to stay healthy, and living on fixed incomes. Cunningham and Lopreato (1977), Gottlieb (1978), Stearns (1975), and Thompson and MacTavish (1976) all reported age as a significant socio-demographic variable but they did not look specifically at regulations pertaining to thermostat settings. They did show, however, that the older age groups seemed to be against gasoline taxes, rationing, and were less likely to believe there was an energy problem.

The regulation most opposed by respondents (81.9%) was "Discourage building homes away from towns and cities to lessen travel by car." The Delphi Panel ranked it fifth in terms of restrictiveness. The logistic regression model for this regulation was the only regulation where there were significant interactions between socio-demographic variables. Responses by rural homeowners (p=.0210) indicated that they have a higher probability of opposing this regulation than do urban renters. Also, sex and education interacted (p=.0510). Females with 0-8 grades/some high school, trade school/some college, or a college degree, have higher probabilities of opposing the regulation than males with high school degrees or graduate work/degree. Rural residency (p=.0028) interacted significantly with opposition, and education interacted significantly (p=.0009) with opposition in the log-linear model. Those with 0-8 grades/some high school, a high school degree, or trade school/some college were more likely to oppose. Sex and tenure also interacted significantly (p=.0011) in the log-linear model for this regulation indicating that homeowners in this study were more likely to be male.

Many rural residents make their living from farm and ranch operations, or from services provided to rural residents. It is not surprising that a proposed regulation to move homes away from their livelihoods would be opposed. In addition, many people choose to move their homes away from towns and cities for variety of reasons and would not choose to move back into the larger populated areas. Several studies cited in the literature (Blakely, 1976; Bultena, 1976; Gottlieb, 1978; Guthrie and Jones, 1982; Keith and Zuiches, 1976;

Marganus, et. al., 1982; Morrison and Gladhart, 1976) supported the proposition that individuals living in rural areas differed significantly from urban individuals in their beliefs and attitudes toward energy conservation. Opposition to this regulation is also more probable for those with less than a college degree (with the exception of high school graduates) and females. The literature supported this finding in that the higher a person's education level, the more likely he/she was to adopt conservation measures and to accept the need for future conservation programs (Barnaby and Reizenstein, 1975; Bultena, 1976; Gottlieb, 1978; Morrison, Keith and Zuiches, 1976; Thompson and MacTavish, 1976; and Zuiches, 1976). Females were also more likely to believe in an energy problem and support conservation policy (Cunningham and Lopreato, 1977; Gottlieb, 1978; Zuiches, 1976). It is not known if female rural respondents in this study are less educated than urban residents, but Census data generally support this proposition (CPRC, 1983).

"Change building codes and mortgage requirements to encourage new types of energy-saving housing" was the regulation ranked the third most restrictive by the Delphi Panel but it was opposed by only 11.2 percent of the respondents. This regulation has a less direct interaction with consumers which may explain the low percentage of opposition. It may also indicate that consumers would like to live in homes that are more energy efficient. Buck (1982) also reported that renters were more favorable toward energy-efficient dwellings.

The two middle age groups (36-50 and 51-65 years of age) were significantly (p=.0609) more likely to oppose this regulation in the logistic regression analysis. Respondents in these two age groups fall in the group often associated with homebuying. Perhaps opposition is due to perceived price increases of houses and mortgage instruments should such a regulation be enacted.

The regulation, "Require land developers to have energy plans as part of their developments," was also opposed by a small percentage of the respondents (16.0%), and ranked the least restrictive out of the seven regulations by the Delphi Panel. In terms of significant socio-demographic variables, sex was significant (p=.0009) in the logistic regression analysis and in the log-linear model (p=.0067). Males have a higher probability of opposing this regulation than do females. Perhaps, because males are more involved occupationally with land development, they would be more likely to oppose such a regulation.

Nonbelief in the seriousness of the energy problem was significantly related to the respondents attitudes of opposition to two of the energy regulations - the two regulations concerning the setting of home thermostats (p=.0348 for 65°F in winter; p=.0212 for 78°F in summer) ranked second and sixth by the Delphi Panel. In addition, the log-linear models showed consistently that nonbelievers tend to be 51 years of age and older. Significant socio-demographic variables from the logistic regression model that predicted nonbelief in the seriousness of the energy problem were sex and education. Males and respondents with education less than a college degree had higher probabilities of not believing. The literature was not consistent about the effects of the sex variable on nonbelief, but it did indicate that people with less education and older people tended not to believe an energy problem existed (Cunningham and Lopreato, 1977; Morrison, Keith, and Zuiches, 1974, 1976; Zuiches, 1976).

The one exception, where believers in the seriousness of the energy problem were more likely to oppose than nonbelievers, was the regulation dealing with land developers. Perhaps this regulation is not seen as contributing substantially to meeting the United States' energy needs.

The literature was inconsistent about whether or not belief in an energy problem influenced attitudes (Gottlieb and Matre, 1975; Hass, et. al., 1975; Heberlein, 1975; Hummel, et. al., 1978; Milstein, 1978; Morrison and Gladhart, 1976; Olson, 1981; Sears, et. al., 1976; Zuiches, 1976). The belief variables in this study interacted three times; nonbelief in the seriousness of the energy problem interacted with two regulations and belief interacted with one regulation (see Tables 73 and 74). The I-E Locus of Control construct did not interact significantly with any of the regulations. However, the sample, which was internally controlled, showed opposition to several of the regulations (see Table 2). Data were too inconclusive to make any definite observations about the support for or against the belief-attitude theory.

The Internal/External Locus of Control Scale measured degree of internality. Three socio-demographic variables - tenure, education, and income - entered the final model predicting low degree of internality in the logistic regression analysis. Generally, there was some support that the lower the educational level and income level, the lower the degree of internality. Seeman (1964) and Strickland (1965) also found this relationship in their research. Homeowners were also more likely to have low degrees of internality. Perhaps homeowners have less control in terms of mobility than do renters and this is reflected here. In the log-linear model, relationships were found between low internality scores and females, rural residents, those over 50 years of age, and respondents with less than a college degree. These relationships are supported by results in previous studies (Cellini and Kantorowski, 1982; Seeman, 1964; Strickland, 1965).

The Internal/External Locus of Control scale results were somewhat disappointing due to the high internal scores (14-33 out of a possible 0-33). Analyses on the total range of possible scores did not occur. Therefore, it is not known if statistical results would have been different. The sample of 893 respondents were nearly all internally controlled. Perhaps internally controlled people are more likely to answer mail questionnaires. However, those socio-demographic variables that were significant in predicting low internality scores support the literature.

In summary, the interactions from the log-linear models indicate that (1) nonbelievers in the seriousness of the energy problem tend to be over 50 years of age and male, (2) nonbelievers in the seriousness of the energy problem tend to oppose mandatory energy conservation regulations related to home thermostat settings, (3) older age groups (over 50 years of age) oppose regulations that affect their immediate environment, (4) homeowners oppose changes to their personal property, regardless of other demographic characteristics such as income or dwelling type, (5) lessening travel by car by moving homes closer to towns and cities was opposed by rural residents, males, homeowners, and those with educations of less than a college degree, (6) respondents with low internality scores tend to be female, rural residents, over 50 years of age, and have less than a college degree.

There were differences in the significant socio-demographic variables that were related to the top three restrictive regulations as ranked by the Delphi Panel. Respectively, (1) tenure, (2) rural/-urban residency and age (36 years and older), and (3) age (36-65 years) were significant. As far as the significant variables for predicting the opposition to the regulations based on socio-demographics, it appears that they vary depending on the perceived impact or consequence of the specific regulation. In other words, individuals may oppose the regulations for reasons other than that they are mandatory.

Based on the literature reviewed in this study and the results of this study, it is proposed that social exchange theory can be applied to the field of energy conservation beliefs, attitudes, intentions, and behaviors. Social exchange theories have, substantively, a long history in sociology and anthropology. However, their history as a self-conscious, deliberate effort to create a theoretical system is relatively short. The theories are anchored in work by Thibaut and Kelley (1959), Homans (1961), Blau (1964), and Levi-Straus (1969). These theories, in turn, have been supported and expanded by Simpson (1972), Ekeh (1974), Chadwick-Jones (1976), and Heath (1976).

The general principle of social exchange theory is that humans avoid costly behavior and seek rewarding statuses, relationships, interaction, and feeling states to the end that their profits are maximized. In seeking rewards, some costs are voluntarily accepted. Likewise, in avoiding costs, some rewards are foregone. However, the person, group or organization will choose the best outcome available, based on ones perception of rewards and costs.

Rewards. Rewards include all things physical, social, and psychological that an individual would choose in the absence of added costs. Thibaut and Kelley (1959) defined rewards as follows: "By rewards, we refer to the pleasures, satisfactions, and gratifications the person enjoys" (p. 12). Statuses, relationships, interaction, experiences other than interaction, and feelings that provide gratification to people are also referred to as rewards by Nye (1979).

Costs. Costs are defined as any status, relationship, interaction, milieu, or feeling disliked by an individual. Thibaut and Kelley (1959) took costs as factors that deter an activity. Costs include two separate and readily distinguishable classes of phenomenon. One class can be termed punishments - things the person dislikes. The other class can be termed rewards foregone. Uncertainty concerning the nature and extent of rewards and costs in an alternative situation creates anxiety and unpredictability for the individual or group considering an alternative course of action. This uncertainty can also be considered as a third type of cost.

Profit. A profit can be determined through rewards and costs involved in decision-making. The most profitable outcome is the one that provides the best relationship of rewards to costs. Whether one is maximizing profits or minimizing losses, the principle is the same - to obtain the most favorable outcome available.

In evaluating profit in a situation, Thibaut and Kelley (1959) defined comparison level as "...a standard by which the person evaluates the rewards and costs of a given relationship in terms of what he feels he deserves" (p. 21). This is related to Homans' (1961) definition of distributive justice:

> The more often in the past an activity entitled under particular stimulus-conditions has been rewarded, the more anger they will display at present when the same activity, emitted under similar conditions, goes without its reward: precedents are always turning into rights (p. 73).

Evaluation of the 'Level of Alternatives' is a comparison of the outcomes in a given relationship, position, or milieu to the outcomes of the alternatives to the relationships, position, or milieu that is involved. Whenever an individual or group perceives they have a better alternative, the theory predicts they will leave their present relationship, position, or milieu for the alternative that offers the better reward-cost outcome.

Outcomes at or above the comparison level are, by definition, satisfactory to the individual or group, and they ordinarily do not seek other alternatives. If they are below the comparison level, new alternatives are sought.

An important concept for social exchange theory is the idea that one should reciprocate favors received from others. The basic theory underlying Thibaut and Kelley (1959), Homans, (1961), Blau (1964), Ekeh (1974), and Heath (1976) is one of <u>choice</u>. One makes an infinite number of choices so as to reduce ones costs and maximize ones rewards for most profit. Some of these choices involve obvious social and/or economic exchanges with individuals. Other less obvious or less direct exchanges are friendship relationships or social and/or economic exchanges with an organization or society as a whole. Therefore, exchanges probably always involve choices, but choices may not necessarily involve exchanges. Choice then, is viewed as the most important aspect of the theory. Heath (1976) stated it this way: "...their general domain is that of choice; exchange is merely part of that domain" (p. 176).

The concepts - costs, rewards, and profits - are substance-free as well as culture-free. The next level of generalized concepts within the theory are also culture-free, and deal with the general sources of costs and rewards - social approval, autonomy, ambiguity, security, money, value/opinion/agreement, and equality.

To summarize the social exchange theory, the basic principles can be stated in a propositional form.

1. Individuals choose those alternatives from which they expect the most profit
2. Costs being equal, individuals choose alternatives from which they anticipate the greatest rewards
3. Rewards being equal, individuals choose alternatives from which they anticipate the fewest costs
4. Immediate outcomes being equal, individuals choose those alternatives that promise better long-term outcomes
5. Long-term outcomes being perceived as equal, individuals choose alternatives providing better immediate outcomes (Nye, 1979).

One other proposition Nye (1979) proposed in terms of the sources of costs and rewards that relates well to energy conservation was:

6. In industrial societies, other costs and rewards

> equal, individuals will choose alternatives that promise the greatest financial gains and the least financial expenditures.

What follows is an effort to relate social exchange theory to energy conservation attitudes, beliefs, and practices. First, an additional proposition is presented as follows:

> 7. Other rewards and costs equal, individuals will choose the alternatives that cause the least inconvenience to them.

Based on the general definition of the theory, we can expect individuals to support and practice energy conservation policies and programs based on the individual's perception of the perceived rewards and costs as they seek to maximize profits (or minimize losses). The individual will try to obtain the most favorable outcome available.

As stated in this study, many energy conservation policies are restrictive because of their costs - be it sacrifice, value- or life-style change, time, economic expenditures, inconvenience, or a combination - to the respondent. The world has not experienced the luxury of the petroleum era for very long, yet we have come to expect and demand the conveniences modern day society has provided. The perceived costs of changing this life-style are tremendous. If people are not perceiving or being offered rewards for conserving energy, support will be minimal - even during an energy crisis.

As discussed in the summary of this study, the significant ($p \leq .10$) socio-demographic variables in predicting opposition to the proposed mandatory regulations, were related to the consequences for those demographic groups, such as age and homeowners. The perceived negative consequences by individuals is also supported by Hannon's study (1975) in which he stated that there were probably no popularly acceptable solutions to energy conservation. In Patterson's study (1975), homeowners' attitudes toward preserving the environment became more negative as the costs to holding those attitudes increased.

Based on the social exchange theory, past literature and the results of this study, a model for analyzing energy conservation beliefs, attitudes, and practices in relation to individuals, businesses, and organizations can be developed. This theory has applicability for energy policymakers. Incentives and rewards that will maximize costs and minimize inconveniences to maximize the profits from conserving energy need to be developed, tested, and implemented.

Recommendations for Further Study

1. In future studies about acceptability of energy policy regulations, more definitive results could be obtained with clearer explanations of the regulations and their probable consequences to respondents. More information is needed as to why respondents oppose or favor mandatory regulations and under what circumstances they would oppose or favor these regulations.
2. Further use of the I-E Locus of Control construct is worth considering. However, a longer version might provide for better discrimination of respondents internal or external locus of control scores.
3. A Delphi Panel should again be utilized. Attempts to reach greater consensus is needed to strengthen the degree of

restrictiveness concept and any associations or correlations made against it.

4. It is recommended that a sampling frame other than telephone books might be more representative of the population. A one-on-one method of data collection might provide the indepth information necessary for discerning acceptability of mandatory energy conservation regulations.
5. A national survey attempt is also recommended. The idea of mandatory energy conservation regulations would affect the nation as a whole and adoption of certain regulations may vary among geographic areas as well as demographic characteristics.
6. The mood of the nation as a whole at the time these data were collected and analyzed was passive toward energy issues. In the past few years energy has not been a national issue as it was in the 70's. It is suggested that further studies analyze differences among individuals' short- and long-range thinking, or those that are energy advocates and those not involved with energy concerns, and perhaps look at individual differences about other national issues and political views. These differences may all affect attitudes toward mandatory energy conservation regulations directly.
7. It is also recommended that other psychological measures, such as authoritarianism, influence of prestige sources, group functioning, etc. be employed in future studies to determine what variables can influence and change attitudes toward mandatory energy conservation regulations.

8. The social exchange theory needs to be developed and applied to future energy conservation research. It is proposed that this theory is applicable and meaningful to policymakers and to the implementation of energy conservation policies and programs. It may help determine how policymakers can increase acceptance of mandatory energy conservation regulations, particularly among groups with socio-demographic differences.

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APPENDICES

APPENDIX A

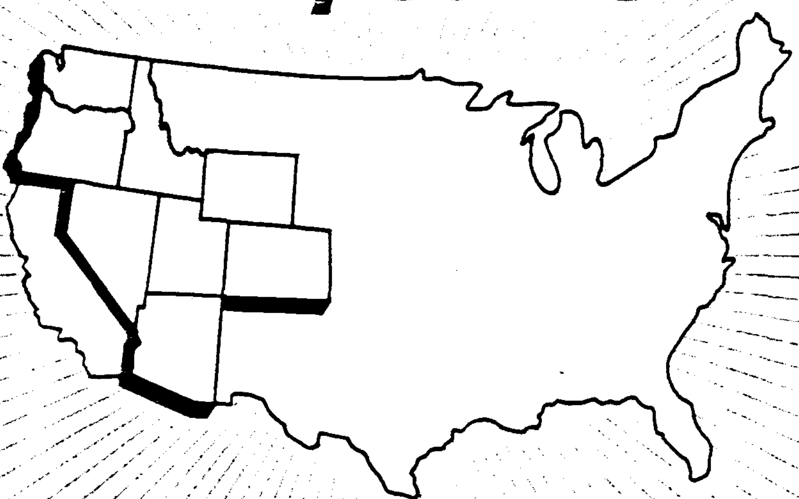
RESEARCH QUESTIONNAIRE

313041

OF ARIZONA, COLORADO STATE UNIV., UNIV. OF IDAHO, UNIV. OF NEVADA-RENO, OREGON STATE UNIV., UTAH STATE UNIV., WASHINGTON STATE UNIV., UNIV. OF WYOMING

JOINTLY SPONSORED BY AGRICULTURAL EXPERIMENT STATIONS AT THE UNIV.

ENERGY DIRECTIONS: A 1983 Western Perspective



* * A STUDY OF HOME RELATED ENERGY CONCERNS IN EIGHT WESTERN STATES * *

Your help with this effort is greatly appreciated! Please use the back page to answer any question in more detail. Thank you!

THE BIG PICTURE

1

Q- 1 Some people feel that energy is a serious national problem, but other people feel it is not. We would like to know your opinion. Do you consider meeting the United States' energy needs during the next ten to twenty years to be: (Please circle number of your opinion.)

1 NOT A SERIOUS PROBLEM
2 A SOMEWHAT SERIOUS PROBLEM
3 A SERIOUS PROBLEM
4 A VERY SERIOUS PROBLEM

Q- 2 If you were asked to reduce your energy consumption during the entire next year by one-fourth--that is, 25 percent less than you now consume--do you feel you could do it? (Please circle number of your opinion.)

1 DEFINITELY YES → If YES, how difficult would this be?
2 PROBABLY YES
3 I DON'T KNOW
4 PROBABLY NO
5 DEFINITELY NO

If YES, how difficult would this be?
1 VERY DIFFICULT
2 SOMEWHAT DIFFICULT
3 NOT DIFFICULT

Q- 3 To what extent do you favor or oppose each of the items listed below as a way of helping to meet our country's future energy needs?

Please circle your opinion for each item

A	More use of solar energy.	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
B	Reduce energy use in homes.	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
C	More use of nuclear power	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
D	More use of western coal.	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
E	Reduce energy use in business and industry.	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
F	More use of oil from western shale. .	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
G	Reduce energy use in individual travel.	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
H	More oil imports.	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
I	More exploration for oil in the U.S.	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
J	Reduce energy use by agriculture. . .	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
K	More use of wind energy	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
L	More use of biomass energy (agricultural residue, animal waste) . .	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
M	More use of small hydro-electric power generation.	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR

ENERGY DIRECTIONS

2

Q- 4 Here are some actions that might be considered in order to reduce energy use in the United States. Please indicate the extent to which you favor or oppose each of them.

	Please circle your opinion for each item				
A Require home thermostats to be no higher than 65°F in winter	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
B Require home thermostats to be no lower than 78°F in summer.	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
C Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
D Provide larger tax credits for improving home energy efficiency . . .	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
E Provide larger tax credit for adding home solar heating or cooling. .	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
F Require utility companies to charge lowest rates to low energy users and highest rates to high users. . .	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
G Discourage building homes away from towns and cities to lessen travel by car	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
H Change building codes and mortgage requirements to encourage new types of energy-saving housing . . .	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
I Require utilities to provide regular reports to users on whether energy use is higher or lower than in previous years	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
J Rely on state instead of federal programs to encourage energy conservation	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR
K Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	STRONGLY OPPOSE	OPPOSE	NEUTRAL	FAVOR	STRONGLY FAVOR

Q- 5 All things considered, do you feel that changes in the cost of energy in the last five years have made your life: (Please circle number of your opinion.)

1 A LOT WORSE THAN IT WAS
2 A LITTLE WORSE THAN IT WAS
3 NO EFFECT
4 A LITTLE BETTER THAN IT WAS
5 A LOT BETTER THAN IT WAS

ENERGY EFFICIENCY AT HOME

3

Q- 6 Listed below are certain energy-saving features that might be added to your home (by you or if you rent, your landlord). (For each item, please circle the one best answer.)

Energy-saving measures:	Existed When I Moved In	Instal-led or Added Before March 1981	Instal-led or Added Since March 1981	Plan To Add Within Two Years	Doesn't Exist And No Plans To Add Within Two Years	I Don't Know/ Doesn't Apply To My Home
A Double panes or storms on most windows.	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
B Good weatherstripping and caulking on most doors and windows. . . .	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
C More than 4 inches of ceiling insulation . . .	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
D Insulation in outside walls.	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
E Thick floor insulation . .	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
F Storm doors on all entrances.	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
G Clock set-back thermostats.	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
H Glass doors on fire-places	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
I Wood-burning stove	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
J Solar hot-water heater . .	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
K Solar heating.	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
L Evaporative cooler	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
M Outdoor window shades. . .	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
N Insulated interior window coverings.	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA
O Other: (Please write in) ______________________	EXISTED	ADDED	ADDED	PLAN	NO	DK/NA

Q- 7 A variety of activities use energy in the home. Considering most homes, please rank each of the following activities 1, 2, 3, or 4, with 1 being the activity that uses the most energy and 4 being the activity that uses the least energy.

_______ WATER HEATING
_______ COOKING
_______ LIGHTING
_______ HOME HEATING/COOLING

Q- 8 To the best of your knowledge, where do you think most of the heat loss occurs in the average home. (Please circle the number of your answer.)

1 THROUGH POORLY FITTED DOORS AND WINDOWS
2 THROUGH POORLY INSULATED FLOORS
3 THROUGH POORLY INSULATED CEILINGS
4 THROUGH POORLY INSULATED EXTERIOR WALLS

Q- 9 Listed below are features that you may have added to change energy use in your home. If you made the changes in 1981 or 1982, please indicate the number of dollars that were spent (before tax credits) for each feature. If added prior to 1981 or does not apply, check the appropriate column.

Type of Investment:	1981	1982	Added Before 1981	Does Not Apply To My Home
A Weatherstripping or caulking. . . .	$____	$____	____	____
B Insulation.	$____	$____	____	____
C Storm doors or storm windows. . . .	$____	$____	____	____
D Wood burning stove.	$____	$____	____	____
E Solar water heating	$____	$____	____	____
F Solar heating	$____	$____	____	____
G Insulated interior window treatment	$____	$____	____	____
H All other (Please write in) __________________ . .	$____	$____	____	____

Q- 10 In recent years it has been possible to claim a credit on your federal income taxes for money spent to improve the energy efficiency of your home (e.g., adding insulation or buying a solar water heater). Which statement best describes your awareness and use of the federal tax credit? (Please circle the best answer.)

1 NOT AWARE OF THE FEDERAL TAX CREDIT
2 AWARE, BUT MADE NO CLAIM ON 1981 OR 1982 TAX RETURN (or will not)
3 AWARE AND A CLAIM MADE ON 1981 TAX RETURN ONLY
4 AWARE AND A CLAIM HAS BEEN OR WILL BE MADE ON 1982 TAX RETURN ONLY
5 AWARE AND A CLAIM HAS BEEN OR WILL BE MADE ON BOTH 1981 AND 1982 TAX RETURN

Q- 11 (For those making [or will be making] a claim on their 1981 or 1982 tax return.) Think about the expenditures you listed in question #9. How did the availability of the federal tax credit affect your decision to spend money for those purposes? (Please circle the best answer.)

1 THE SAME AMOUNT OF MONEY WOULD HAVE BEEN SPENT EVEN WITHOUT THE FEDERAL TAX CREDIT
2 A LITTLE LESS MONEY WOULD HAVE BEEN SPENT IF THE FEDERAL TAX CREDIT HAD NOT BEEN AVAILABLE
3 MUCH LESS MONEY WOULD HAVE BEEN SPENT IF THE FEDERAL TAX CREDIT HAD NOT BEEN AVAILABLE
4 NONE OF THE MONEY WOULD HAVE BEEN SPENT WITHOUT THE FEDERAL TAX CREDIT
5 DON'T KNOW OR CAN'T REMEMBER

5

HOUSING SATISFACTION

Q- 12A For each statement below, circle the number that best indicates how you feel on a scale of 1 to 7, with 1 being extremely dissatisfied and 7 being extremely satisfied.

	Please circle your answer						
A In general, how satisfied or dissatisfied are you with your housing?.	1	2	3	4	5	6	7
B How satisfied or dissatisfied are you with the comfort of your house?.	1	2	3	4	5	6	7
C How satisfied or dissatisfied are you with the energy efficiency of your current dwelling?	1	2	3	4	5	6	7

Q- 12B For each statement below, circle the number that best indicates how you feel on a scale of 1 to 7, with 1 being extremely unimportant and 7 being extremely important.

	Please circle your answer						
A How important is it to you to have energy-saving features in your house?.	1	2	3	4	5	6	7
B How important is it to you to have a home that costs you less money for energy?	1	2	3	4	5	6	7
C How important is it for you to have convenience with energy-saving features in your home? (time and effort).	1	2	3	4	5	6	7

Q- 12C Compared to the dollar ($) amount the average Oregon family spends for energy, do you feel you spend: (Please circle number of your opinion.)

1 A LOT LESS MONEY
2 SOMEWHAT LESS MONEY
3 ABOUT AVERAGE
4 SOMEWHAT MORE MONEY
5 A LOT MORE MONEY

Q- 12D Compared to the time and effort the average Oregon family puts into energy conservation, do you feel you spend: (Please circle number of your opinion.)

1 A LOT LESS TIME AND EFFORT
2 SOMEWHAT LESS TIME AND EFFORT
3 ABOUT AVERAGE
4 SOMEWHAT MORE TIME AND EFFORT
5 A LOT MORE TIME AND EFFORT

Q- 12E Conservation can be practiced in many ways. Listed below are some conservation efforts you may or may not be doing. For each item, tell whether this is always, sometimes, or never done now.

	Please circle your answer		
A Recycle newspapers, glass, and tin cans . .	.ALWAYS	SOMETIMES	NEVER
B Ride a bicycle on errands	.ALWAYS	SOMETIMES	NEVER
C Participate in a car pool/van pool, or ride the bus	.ALWAYS	SOMETIMES	NEVER
D Dry laundry on a clothesline.	.ALWAYS	SOMETIMES	NEVER
E Keep records of home energy usage	.ALWAYS	SOMETIMES	NEVER

Q- 13 The following statements are related to adult attitudes and feelings. They are more about "life in general" than any one specific topic. The best way to answer these statements is as rapidly as you can. Please circle YES or NO to your first reaction to each statement.

YES NO 1. Do you believe that most problems will solve themselves if you just don't fool with them?
YES NO 2. Do you believe that you can stop yourself from catching a cold?
YES NO 3. Are some people just born lucky?
YES NO 4. Are you often blamed for things that just aren't your fault?
YES NO 5. Do you believe that if somebody studies hard enough he/she can pass any subject?
YES NO 6. Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway?
YES NO 7. Do you feel that if things start out well in the morning that it's going to be a good day no matter what you do?
YES NO 8. Do you feel that most of the time parents listen to what their children have to say?
YES NO 9. Do you believe that wishing can make good things happen?
YES NO 10. Most of the time do you find it hard to change a friend's opinion (mind)?
YES NO 11. Do you think that cheering more than luck helps a team to win?
YES NO 12. Do you believe that parents should allow children to make most of their own decisions?
YES NO 13. Do you feel that when you do something wrong there's very little you can do to make it right?
YES NO 14. Do you believe that most people are just born good at sports?
YES NO 15. Are most of the people your age stronger than you are?
YES NO 16. Do you feel that one of the best ways to handle most problems is just not to think about them?
YES NO 17. Do you feel that you have a lot of choice in deciding who your friends are?
YES NO 18. If you find a four leaf clover do you believe that it might bring you good luck?
YES NO 19. Do you feel that when a person decides to hit you, there's little you can do to stop him or her?
YES NO 20. Have you ever had a good luck charm?
YES NO 21. Do you believe that whether or not people like you depends on how you act?
YES NO 22. Have you felt that when people were mean to you it was usually for no reason at all?
YES NO 23. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?
YES NO 24. Do you believe that when bad things are going to happen they just are going to happen no matter what you try to do to stop them?
YES NO 25. Do you think that people can get their own way if they just keep trying?
YES NO 26. Do you feel that when good things happen they happen because of hard work?
YES NO 27. Do you feel that when somebody wants to be your enemy there's little you can do to change matters?
YES NO 28. Do you feel that it's easy to get friends to do what you want them to?
YES NO 29. Do you usually feel that you have little to say about what you get to eat at home?
YES NO 30. Do you feel that when someone doesn't like you there's little you can do about it?
YES NO 31. Are you the kind of person who believes that planning ahead makes things turn out better?
YES NO 32. Most of the time, do you feel that you have little to say about what your family decides to do?
YES NO 33. Do you think it's better to be smart than to be lucky?

WAYS TO CUT BACK

7

Q- 14 Here are some other efforts you may or may not be doing to save heating and cooling costs in your home. For each item, tell whether you now do it, or plan to do it in the future.

(Please circle the best answer.)

	Energy-saving efforts:	This Is Done Now	Don't Do Now, But Plan To Do Within Two Years	Don't Do Now, And No Plans For Future	I Don't Know or Doesn't Apply To My Home
A	Close off some rooms.	NOW	PLAN	NO PLAN	NA
B	Have water heater set to 120°F (or less). . .	NOW	PLAN	NO PLAN	NA
C	In winter, set thermostat at 65°F or lower. .	NOW	PLAN	NO PLAN	NA
D	In summer, set thermostat at 78°F or higher .	NOW	PLAN	NO PLAN	NA
E	Change use of rooms to take advantage of sun-warmed or shaded areas	NOW	PLAN	NO PLAN	NA
F	Open and close window coverings to take advantage of sun and temperature differences.	NOW	PLAN	NO PLAN	NA
G	Home inspected ("audited") for energy efficiency.	NOW	PLAN	NO PLAN	NA

Q- 15 Costs for heating fuel, gasoline, and electricity have gone up a great deal in the last few years. To what extent, if at all, have higher energy costs made you cut back on any of the items listed below.

To what extent have higher energy costs made you cut back? (Please circle your answer.)

A	Groceries	NONE	A LITTLE	SOME	A LOT
B	Meals out	NONE	A LITTLE	SOME	A LOT
C	Driving the car (or other vehicle).	NONE	A LITTLE	SOME	A LOT
D	Health care	NONE	A LITTLE	SOME	A LOT
E	Vacations	NONE	A LITTLE	SOME	A LOT
F	Recreation.	NONE	A LITTLE	SOME	A LOT
G	Education	NONE	A LITTLE	SOME	A LOT
H	Housing (rent, mortgage or upkeep).	NONE	A LITTLE	SOME	A LOT
I	Purchase of appliances or furnishings	NONE	A LITTLE	SOME	A LOT
J	Money put in savings.	NONE	A LITTLE	SOME	A LOT
K	Clothes	NONE	A LITTLE	SOME	A LOT

Q- 16 What is the main fuel used in your home for: (Please write in the fuel source, i.e., electricity, natural gas, LP gas, fuel oil, etc.)

______________________ WATER HEATING

______________________ HEATING YOUR HOME

ABOUT YOUR HOME

Q- 17 Which of the following best describes your primary residence? (Please circle number of your opinion.)

1 A MOBILE HOME OR TRAILER
2 A ONE-FAMILY HOUSE DETACHED FROM ANY OTHER HOUSE
3 A BUILDING FOR TWO TO FOUR HOUSEHOLDS (FAMILIES)
4 A BUILDING FOR FIVE OR MORE HOUSEHOLDS (FAMILIES)
5 OTHER: (Please describe.)______________________

Q- 18 Is the home in which you live:

1 RENTED BY YOU
2 OWNED BY YOU
3 OWNED IN CONDOMINIUM BY YOU
4 OTHER: (Please describe.)______________________

Q- 19 Which of these broad categories best describes the number of square feet in your home? Do not include a garage, unfinished basement, or space rented to members of another household. Just your best estimate is fine.

1 LESS THAN 500 SQUARE FEET
2 501 TO 1,000 SQUARE FEET
3 1,001 TO 1,500 SQUARE FEET
4 1,501 TO 2,000 SQUARE FEET
5 2,001 TO 2,500 SQUARE FEET
6 MORE THAN 2,500 SQUARE FEET

Q- 20 When did you move into your present home?

_______ YEAR MOVED IN (If less than one year, what month?_______)

Q- 21 To the best of your knowledge, about when was your home built? We mean first constructed and not when remodeled, added to, or converted.

_______ YEAR BUILT

Q- 22 How do you feel about the energy efficiency of your present home: (Please circle number of your opinion.)

1 ABOUT AS ENERGY EFFICIENT AS IT CAN BE
2 A LITTLE IMPROVEMENT CAN BE MADE
3 SOME IMPROVEMENT CAN BE MADE
4 A LOT OF IMPROVEMENT CAN BE MADE

(Note: If your home is part of a farm or other business, please check here☐, and answer questions 23 and 24 as best you can for the residential part of your property.)

Q- 23 As best as you can remember, how much were your total energy bills in 1982? If your bills or checkbook are handy, they could be helpful.

	1982
1 ELECTRICITY	$_________
2 FUEL OIL	$_________
3 WOOD (NO. OF CORDS ______)	$_________
4 NATURAL GAS	$_________
5 OTHER: (e.g., coal, propane, or?)_______________	$_________

9

Everyone	Homeowners Only
Q- 24 About how much a month do you pay for rent or house payments? (Include space rent if in mobile home park.)	What is the value of your home? That is, about how much do you think it would sell for if it were for sale?
1 NO PAYMENT OR RENT	1 LESS THAN $25,000
2 LESS THAN $100	2 $25,000 TO $49,999
3 $100 to $199	3 $50,000 TO $74,999
4 $200 TO $299	4 $75,000 to $99,999
5 $300 TO $399	5 $100,000 TO $124,999
6 $400 TO $499	6 $125,000 TO $174,999
7 $500 TO $749	7 $175,000 to $249,999
8 $750 TO $999	8 MORE THAN $250,000
9 $1,000 OR MORE	

FINALLY, WE WOULD LIKE TO ASK A FEW QUESTIONS ABOUT YOURSELF TO HELP WITH ANALYSIS OF THE RESULTS.

Q- 25 Where is your residence located?

_______________ COUNTY

_______________ ZIP CODE

_______________ TOWN OR CITY IN WHICH (OR NEAREST TO) YOUR RESIDENCE IS LOCATED

→ Is your home: (Please circle.)

1 INSIDE THE CITY LIMITS
2 OUTSIDE THE CITY LIMITS

Q- 26 Are you: (Please circle number of your opinion.)

1 MARRIED
2 DIVORCED
3 WIDOWED
4 SEPARATED
5 NEVER MARRIED

Q- 27 Please list everyone who lives in your household by their relationship to you, starting with the adult(s). (Please list as husband, wife, parent, friend, son, daughter, etc.--names are not necessary.)

	Age (In Years)	Sex (M = Male; F = Female)
1 Yourself	[ ]	[ ]
2 ____________	[ ]	[ ]
3 ____________	[ ]	[ ]
4 ____________	[ ]	[ ]

If more space is needed, please put ages here:

FEMALES ___; ___; ___; ___; ___; ___; ___

MALES ___; ___; ___; ___; ___; ___; ___

Please answer these questions for yourself and your spouse or other adult partner (if you have one).

	YOURSELF	SPOUSE OR PARTNER
Q- 28	Are you primarily: 1 EMPLOYED FULL TIME 2 EMPLOYED PART TIME 3 NOT EMPLOYED OUTSIDE THE HOME 4 UNEMPLOYED 5 RETIRED	Is he/she primarily: 1 EMPLOYED FULL TIME 2 EMPLOYED PART TIME 3 NOT EMPLOYED OUTSIDE THE HOME 4 UNEMPLOYED 5 RETIRED
Q- 29	Your usual occupation when employed (or before retirement): __________ TITLE __________ TYPE OF COMPANY OR BUSINESS	His/her usual occupation when employed (or before retirement): __________ TITLE __________ TYPE OF COMPANY OR BUSINESS
Q- 30	(If employed) About how far is it from home to where you work: ______ MILES	(If employed) About how far is it from home to where he/she works: ______ MILES
Q- 31	Your highest level of education: 1 0-8 GRADES 2 SOME HIGH SCHOOL 3 HIGH SCHOOL GRADUATE 4 TRADE SCHOOL 5 SOME COLLEGE 6 COLLEGE (4 year) GRADUATE 7 SOME GRADUATE WORK 8 A GRADUATE DEGREE	His/her highest level of education: 1 0-8 GRADES 2 SOME HIGH SCHOOL 3 HIGH SCHOOL GRADUATE 4 TRADE SCHOOL 5 SOME COLLEGE 6 COLLEGE (4 year) GRADUATE 7 SOME GRADUATE WORK 8 A GRADUATE DEGREE

Q- 32 Some people have many types of investment experiences, and others do not. Which of the following types of investments, if any, have you owned in the last ten years: (Please circle all that apply.)

1 A BUSINESS
2 A HOME
3 OTHER REAL ESTATE THAN YOUR HOME
4 UNITED STATES SAVINGS BONDS
5 PASSBOOK SAVINGS ACCOUNT
6 TIME SAVINGS DEPOSITS
7 MUTUAL FUNDS
8 MUNICIPAL BONDS
9 TREASURY NOTES OR BILLS
10 GOLD OR SILVER
11 STOCKS OR BONDS OF CORPORATIONS
12 MONEY MARKETS
13 NONE

Q- 33 Which of these broad categories describes your total family income before taxes in 1982? (Please circle the number of appropriate category.)

1 LESS THAN $5,000
2 $5,000 TO $9,999
3 $10,000 TO $14,999
4 $15,000 TO $19,999
5 $20,000 TO $24,999
6 $25,000 TO $29,999
7 $30,000 TO $39,999
8 $40,000 TO $49,999
9 $50,000 OR MORE

School of Home Economics

Oregon State University

Corvallis, Oregon 97331

(503) 754-3551

February 15, 1983

Costs for heating fuel and electricity continue to go up, and future energy shortages seem possible. Yet, little is known about how people are being affected by these concerns. Nor do we know what kinds of actions, if any, people want to see taken. To find out, we need your help.

Your household is one of a small number being asked to assist. It was chosen in a random sample of Oregon and seven other western states. To truly represent the experiences of people throughout the region, it is important that each questionnaire be completed.

An equal number of men and women are being asked to help. In your household we would like to ask that the questionnaire be completed by an adult female if there is one. If not, then an adult male should complete it.

You may be assured of complete confidentiality. You will see an identification number on the front of the questionnaire. This is so your name can be checked off the mailing list when it is returned. Your name will never be placed on the questionnaire or associated with any of the information you provide. We hope you will participate. However, the study is voluntary, and if you do not want to answer, please let us know by returning the blank questionnaire.

We believe it is important that results of this study be brought to the attention of people concerned with our nation's energy policies, and other interested people. If you would like a summary (they are free), please write "send results" on the back of the return envelope.

I would be most happy to answer any questions you might have. Please call or write. My telephone number is (503) 754-3211. Thanks for your help with this important effort.

Cordially,

Sue Badenhop
Project Director

SB/mkm
Enclosure

School of Home Economics
Oregon State University
Corvallis, Oregon 97331
(503) 754-3551

February 15, 1983

Costs for heating fuel and electricity continue to go up, and future energy shortages seem possible. Yet, little is known about how people are being affected by these concerns. Nor do we know what kinds of actions, if any, people want to see taken. To find out, we need your help.

Your household is one of a small number being asked to assist. It was chosen in a random sample of Oregon and seven other western states. To truly represent the experiences of people throughout the region, it is important that each questionnaire be completed.

An equal number of men and women are being asked to help. In your household we would like to ask that the questionnaire be completed by an adult male if there is one. If not, then an adult female should complete it.

You may be assured of complete confidentiality. You will see an identification number on the front of the questionnaire. This is so your name can be checked off the mailing list when it is returned. Your name will never be placed on the questionnaire or associated with any of the information you provide. We hope you will participate. However, the study is voluntary, and if you do not want to answer, please let us know by returning the blank questionnaire.

We believe it is important that results of this study be brought to the attention of people concerned with our nation's energy policies, and other interested people. If you would like a summary (they are free), please write "send results" on the back of the return envelope.

I would be most happy to answer any questions you might have. Please call or write. My telephone number is (503) 754-3211. Thanks for your help with this important effort.

Cordially,

Sue Badenhop
Project Director

SB/mkm
Enclosure

School of Home Economics
Oregon State University
Corvallis, Oregon 97331
(503) 754-3551

February 15, 1983

Two years ago your household was one of a small number in Oregon and nine other western states asked to assist in a study of home energy concerns by completing the brief questionnaire. We greatly appreciated your participation in that effort.

Since that time, costs for heating fuel and electricity have changed. To better understand how people are being affected by these changes and what kind of actions, if any, people want to see taken, we again are asking for your help. Since your household was in a carefully drawn random sample of the state, it's important to also have your participation in the final part of this study.

It is very important that the person who completed the questionnaire in March 1981 also complete the following questionnaire. If that person no longer lives in your household or is unavailable, then the adult most responsible for housing decisions should complete it.

As before, your answers to this questionnaire are confidential. You will see an identification number on the front of the questionnaire. This is so your name can be checked off the mailing list when it is returned. Your name will never be placed on the questionnaire or associated in any way with the information you provide. We hope you will participate. However, the study is voluntary, and if you do not want to answer, please let us know by simply returning the blank questionnaire.

We believe it is important that the results of this study be brought to the attention of people concerned with state and national energy policies, and other interested people. If you would like a summary (they are free) please write "send results" on the back of the return envelope.

I would be most happy to answer any questions you might have. Please call or write. My telephone number is (503) 754-3211. Thank you very much.

Cordially,

Sue Badenhop
Project Director

Follow-Up Postcard

February 22, 1983

Last week a questionnaire seeking your opinion about energy directions and concerns facing Oregon and other western states was mailed to you.

If you already completed and returned the questionnaire, please accept our sincere thanks. If not, please do so today. Your household was drawn in a random sample of ten western states. Because it has been sent to a small representative sample of people throughout the western United States, it is extremely important that yours be included in the study.

If by some chance you did not receive the questionnaire, or it was misplaced, please call me collect (503)754-3211, and I will get another one in the mail to you today.

Sincerely,

Sue Badenhop
Project Director

School of
Home Economics

Oregon State University

Corvallis, Oregon 97331

(503) 754-3551

March 7, 1983

About three weeks ago I wrote you seeking your opinion about some home related energy issues facing us. As of today I have not yet received your completed questionnaire.

This study has been undertaken as a regional project by ten Agricultural Experiment Stations in the belief that citizens of the Western Region should be heard in the formation of public policies concerning energy. It is the largest study concerning energy opinions ever conducted in the Western Region.

I am writing to you again because your opinions are very important to the success of this study. Your name was selected through a scientific sampling process in which every household in Oregon had an equal chance of being drawn. In order that the results be truely representative, it is essential that each person in the sample return the questionnaire.

In the event that your questionnaire has been misplaced. a replacement is enclosed.

Your cooperation is greatly appreciated.

Cordially,

Suzanne Badenhop
Project Director

SB/mm
Enclosure

APPENDIX B

LOGISTIC REGRESSION TABLES

Table B-I
Logistic Model for Belief in the Energy Problem

(2) STATISTICS TO ENTER OR REMOVE TERMS

Term	Approx. F to Enter	d.f.	d.f.	Approx. F to Remove	d.f.	d.f.	P-Value
Sex				11.84	1	781	.0006
Education				3.03	4	778	.0171
Constant				IS IN	MAY NOT BE REMOVED.		

(3) SUMMARY OF STEPWISE RESULTS

Step No	Term Entered	d.f.	Log Likelihood	Improvement Chi-Square	P-Value
0			-183.550		
1	Sex	1	-177.696	11.708	.001
2	Education	4	-167.917	19.557	.001

Table B-II
Logistic Model for Home Thermostats 65°F in Winter

(2) STATISTICS TO ENTER OR REMOVE TERMS

Term	Approx. F to Enter	d.f.	d.f.	Approx. F to Remove	d.f.	d.f.	P-Value
Rural/Urban				4.95	1	703	.0264
Age				2.78	3	701	.0405
Constant				IS IN	MAY NOT BE REMOVED.		

(3) SUMMARY OF STEPWISE RESULTS

Step No	Term Entered	d.f.	Log Likelihood	Improvement Chi-Square	P-Value
0			-440.695		
1	Rural/Urban	1	-437.988	5.414	.020
2	Age	3	-433.828	8.319	.040

Table B-III
Logistic Model for Home Thermostats 78°F in Summer

(2) STATISTICS TO ENTER OR REMOVE TERMS

Term	Approx. F to Enter	d.f.	d.f.	Approx. F to Remove	d.f.	d.f.	P-Value
Age				2.16	3	641	.0919
Income	1.35	5	639				.2420
Constant				IS IN	MAY NOT BE REMOVED.		

(3) SUMMARY OF STEPWISE RESULTS

Step No	Term Entered	d.f.	Log Likelihood	Improvement Chi-Square	P-Value
0			-433.700		
1	Age	3	-440.419	6.561	.087

Table B-IV
Logistic Model for Energy Audit

(2) STATISTICS TO ENTER OR REMOVE TERMS

Term	Approx. F to Enter	d.f.	d.f.	Approx. F to Remove	d.f.	d.f.	P-Value
Tenure				9.74	1	656	.0019
Age	.99	3	654				.3952
I-E Scale	.05	1	656				.8239
Constant				IS IN	MAY NOT BE REMOVED.		

(3) SUMMARY OF STEPWISE RESULTS

Step No	Term Entered	d.f.	Log Likelihood	Improvement Chi-Square	Improvement P-Value
0			-446.698		
1	Tenure	1	-441.752	9.892	.002

Table B-V
Logistic Model for Utility Rates

(2) STATISTICS TO ENTER OR REMOVE TERMS

Term	Approx. F to Enter	d.f.	d.f.	Approx. F to Remove	d.f.	d.f.	P-Value
Tenure	1.67	1	661				.1967
Marital Status	.64	4	658				.6325
Age				6.49	3	659	.0002
Constant				IS IN	MAY NOT BE REMOVED.		

(3) SUMMARY OF STEPWISE RESULTS

Step No	Term Entered	d.f.	Log Likelihood	Improvement Chi-Square	Improvement P-Value
0			-407.005		
1	Age	3	-396.974	20.062	.000

Table B-VI
Logistic Model for Discouraging Travel

(2) STATISTICS TO ENTER OR REMOVE TERMS

Term	Approx. F to Enter	d.f.	d.f.	Approx. F to Remove	d.f.	d.f.	P-Value
Rural/Urban				IS IN	MAY NOT BE REMOVED.		
Tenure				IS IN	MAY NOT BE REMOVED.		
(A) * (B)				5.36	1	594	.0210
Sex				IS IN	MAY NOT BE REMOVED.		
Education				IS IN	MAY NOT BE REMOVED.		
(C) * (D)				2.37	4	591	.0510
(A) * (C)	.27	1	594				.6029
(A) * (D)	.52	4	591				.7204
(B) * (C)	.69	1	594				.4060
(B) * (D)	.67	4	591				.6120
Constant				IS IN	MAY NOT BE REMOVED.		

(3) SUMMARY OF STEPWISE RESULTS

Step No	Term Entered	d.f.	Log Likelihood	Improvement Chi-Square	P-Value
0			-284.412		
1	Rural/Urban	1	-274.998	18.828	.000
2	Education	4	-264.777	20.442	.000
3	Tenure	1	-262.951	3.653	.056
4	(A) * (B)	1	-259.832	6.238	.013
5	Sex	1	-257.462	4.738	.029
6	(C) * (D)	4	-252.203	10.520	.033

Table B-VII
Logistic Model for Change Building Codes

(2) STATISTICS TO ENTER OR REMOVE TERMS

Term	Approx. F to Enter	d.f.	d.f.	Approx. F to Remove	d.f.	d.f.	P-Value
Tenure	.76	1	690				.3823
Age				2.47	3	688	.0609
Constant				IS IN	MAY NOT BE REMOVED.		

(3) SUMMARY OF STEPWISE RESULTS

Step No	Term Entered	d.f.	Log Likelihood	Improvement Chi-Square	P-Value
0			-231.376		
1	Age	3	-227.421	7.910	.048

Table B-VIII
Logistic Model for Land Developers

(2) STATISTICS TO ENTER OR REMOVE TERMS

Term	Approx. F to Enter	d.f.	d.f.	Approx. F to Remove	d.f.	d.f.	P-Value
Rural/Urban	2.01	1	652				.1568
Sex				11.17	1	652	.0009
Constant				IS IN	MAY NOT BE REMOVED.		

(3) SUMMARY OF STEPWISE RESULTS

Step No	Term Entered	d.f.	Log Likelihood	Improvement Chi-Square	P-Value
0			-288.315		
1	Sex	1	-282.258	12.114	.001

Table B-IX
Logistic Model for Locus of Control Scale

(2) STATISTICS TO ENTER OR REMOVE TERMS

Term	Approx. F to Enter	d.f.	d.f.	Approx. F to Remove	d.f.	d.f.	P-Value
Type of Dwelling	.67	3	581				.5723
Tenure				3.23	1	583	.0728
Marital Status	1.30	4	580				.2681
Age	.60	3	581				.6154
Sex	.45	1	583				.5031
Education				7.97	4	580	.0000
Income				2.87	5	579	.0143
Rural/Urban	1.77	1	583				.1840
Constant				IS IN	MAY NOT BE REMOVED		

(3) SUMMARY OF STEPWISE RESULTS

Step No	Term Entered	d.f.	Log Likelihood	Improvement Chi-Square	Improvement P-Value
0			-410.867		
1	Education	4	-380.990	59.755	.000
2	Income	5	-374.747	12.487	.029
3	Tenure	1	-373.084	3.326	.068

APPENDIX C

DELPHI PANEL TECHNIQUE

Cover Letter for First Round of Delphi Panel Ranking

School of Home Economics
Oregon State University
Corvallis, Oregon 97331
(503) 754-3551

January 16, 1984

Dear,

Regulations and government policies typically vary in the degree of restrictiveness or freedom of choice households have concerning them. For example, cigarette taxes and the 55 mph speed limit have different degrees of restrictiveness for households.

Just as there are variations of restrictiveness in these examples, energy regulations vary in degree of restrictiveness as well. We are trying to establish a scale which ranks energy regulations according to the degree of restrictiveness for an average household.

We are utilizing an expert panel in an effort to establish a rank order of energy regulations taken from a Western Regional energy conservation research project, for purposes of data analysis. Your name was selected as a person who works in energy or a related area. Your participation on this panel is critical to the establishment of this scale. Consensus is an important part of establishing a scale in this manner; therefore, you will receive a second follow-up letter to determine consensus within the group.

We hope that you will participate in this research step. It should only take a few minutes of your time. You may be assured of confidentiality. The identification number on the return envelope is to your name can be checked off the mailing list when it is returned. We also ask that you refrain from discussing this activity with anyone until we complete the scale as it is important that the panel retain anonymity.

Please follow the instructions on the attached page and return the cards in the envelope provided. Your prompt attention is appreciated. If you have any questions please feel free to write or call (503/754-3211). Thank you.

Sincerely,

Michele Merfeld
Principal Investigator

Suzanne Badenhop
Associate Professor

Definition and Assumptions for Delphi Panel Ranking

DEGREE OF RESTRICTIVENESS SCALE

The following definition and criterion has been established by the researcher in order to assure (as much as possible) that all expert panel members are operating from the same definition concerning the ranking of these energy conservation regulations.

Please read the definition and assumptions carefully before ranking the regulations.

Mandatory energy conservation regulations are outer-imposed laws or policies (those enacted and enforced by an agency or entity outside the direct control of an individual household) that would restrict, or limit, personal choice and behavior of members of society in an effort to reduce the amount of energy consumed.

The degree to which these laws would change personal behavior, cause personal inconvenience, or change current lifestyle, depends in part on:

(1) whether or not the proposed regulation (law) is already being practiced by an individual (or household)

(2) the degree to which an individual is in sympathy with the expected practice or the current administration

(3) whether an individual (or household) has the resources to comply

(4) whether the regulation is applicable to a geographic area (i.e., air conditioning), and

(5) how well the regulation is perceived to be enforceable.

For the purpose of this research effort, assume that (1) individuals are taking minimal efforts to conserve energy, and (2) that enforcements are viable.

Instructions for Delphi Panel Ranking - First Round

BASED ON THE PREVIOUS DEFINITION AND ASSUMPTIONS, PLEASE COMPLETE THE FOLLOWING STEPS. (THE REGULATIONS ARE INDIVIDUALLY LISTED ON THE ENCLOSED CARDS.)

STEP 1: Which ONE of the following regulations (see cards) do you think would be the MOST restrictive to individuals in the Pacific Northwest?

Write a Number one (1) in the space labeled "rank" on the card with the chosen regulation.

STEP 2: Which one of the remaining regulations do you think is the MOST restrictive to individuals in the Pacific Northwest?

Write a Number two (2) in the space labeled "rank" on the card with the chosen regulation.

STEP 3: Which one of the remaining regulations do you think is the MOST restrictive to individuals in the Pacific Northwest?

Write a Number three (3) in the space labeled "rank on the card with the chosen regulation.

REPEAT THIS PROCESS UNTIL YOU HAVE RANKED ALL ELEVEN REGULATIONS.

PLEASE RETURN ALL ELEVEN CARDS IN THE ENCLOSED ENVELOPE. THANK YOU!

Regulations given to the Delphi Panel
(listed on 3x5 cards)

Energy Conservation Regulation:

PROVIDE LARGER TAX CREDITS FOR
IMPPOVING HOME ENERGY EFFICIENCY

RANK________________

Energy Conservation Regulation

PROVIDE LARGER TAX CREDIT FOR ADDING
HOME SOLAR HEATING OR COOLING

RANK________________

Energy Conservation Regulation

REQUIRE UTILITIES TO PROVIDE REGULAR
REPORTS TO USERS ON WHETHER ENERGY
USE IS HIGHER OR LOWER THAN IN
PREVIOUS YEARS

RANK ________________

Regulations given to the Delphi Panel
(listed on 3x5 cards)

Energy Conservation Regulation:

DISCOURAGE BUILDING HOMES AWAY FROM TOWNS AND CITIES TO LESSEN TRAVEL BY CAR

RANK ______________

Energy Conservation Regulation:

REQUIRE EVERYONE'S HOME TO PASS AN ENERGY "AUDIT" (MUST HAVE ADEQUATE INSULATION, DOUBLE-PANE OR STORM WINDOWS, ETC.)

RANK ______________

Energy Conservation Regulation

RELY ON STATE INSTEAD OF FEDERAL PROGRAMS TO ENCOURAGE ENERGY CONSERVATION

RANK ______________

Regulations given to the Delphi Panel
(listed on 3x5 cards)

Energy Conservation Regulation:

CHANGE BUILDING CODES AND MORTGAGE REQUIREMENTS TO ENCOURAGE NEW TYPES OF ENERGY-SAVING HOUSING

RANK ______________

Energy Conservation Regulation:

REQUIRE LAND DEVELOPERS TO HAVE ENERGY PLANS AS PART OF THEIR DEVELOPMENTS (e.g., SOLAR ORIENTATION ON BUILDING SITES; SOLAR ACCESS; LANDSCAPING, ETC.)

RANK ______________

Energy Conservation Regulation:

REQUIRE HOME THERMOSTATS TO BE NO LOWER THAN 78°F IN SUMMER

RANK ______________

Regulations given to the Delphi Panel
(listed on 3x5 cards)

Energy Conservation Regulation:

REQUIRE UTILITY COMPANIES TO CHARGE LOWEST RATES TO LOW ENERGY USERS AND HIGHEST RATES TO HIGH USERS

RANK ________________

Energy Conservation Regulation:

REQUIRE HOME THERMOSTATS TO BE NO HIGHER THAN 65°F IN WINTER

RANK ________________

Cover Letter for Second Round of Delphi Panel Ranking

School of Home Economics
Oregon State University
Corvallis, Oregon 97331
(503) 754-3551

February 16, 1984

Dear

The first phase of the research effort to rank eleven energy conservation regulations is now complete. Thank you for participating on the expert panel.

As mentioned in the first letter, one of the purposes of using an expert panel in a research effort such as this, is to reach a consensus. Therefore, we would appreciate your involvement one more time.

In an effort to reach consensus we would now like you to think about your original rankings as compared to the panel's averages and subsequent ranking. After comparison, please rerank the regulations (1 = most restrictive, 11 = least restrictive). You may or may not choose to change your original rankings.

The enclosed sheet lists the eleven regulations according to the panel averages for each regulation. Your original ranking is also listed. The definition of mandatory energy conservation regulations is again provided to refresh your memory.

Please return the sheet with your second ranking in the enclosed envelope. If you have questions, please feel free to write or call (503/ 754-3211). Your prompt participation and time spent in this effort is greatly appreciated.

Sincerely,	Sincerely,
Michele Merfeld	Suzanne Badenhop
Principal Investigator	Associate Professor
University of Wyoming	Oregon State University

Instructions for Second Round of Delphi Panel Ranking

Panel Averages Per Regulation	Original Ranking (1-11)	Second Ranking (1-11)
(1.) Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.) PANEL AVERAGE = 2.2	______	______
(2.) Require home thermostats to be no higher than 65°F in winter PANEL AVERAGE = 3.0	______	______
(3.) Require utility companies to charge lowest rates to low energy users and highest rates to high users PANEL AVERAGE = 4.4	______	______
(4.) Change building codes and mortgage requirements to encourage new types of energy-saving housing PANEL AVERAGE = 4.6	______	______
(5.) Discourage building homes away from towns and cities to lessen travel by car PANEL AVERAGE = 5.0	______	______
(6.) Require home thermostats to be no lower than 78°F in summer PANEL AVERAGE = 5.2	______	______
(7.) Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.) PANEL AVERAGE = 6.0	______	______
(8.) Rely on state instead of federal programs to encourage energy conservation PANEL AVERAGE = 8.0	______	______
(9.) Provide larger tax credit for adding home solar heating or cooling PANEL AVERAGE = 8.8	______	______
(10) Provide larger tax credits for improving home energy efficiency PANEL AVERAGE = 8.9	______	______
(11) Require utilities to provide regular reports to users on whether energy use is higher or lower than in previous years PANEL AVERAGE = 9.3	______	______

Delphi Panel Mailing List

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APPENDIX D

PREDICTED PROBABILITIES FROM THE LOGISTIC REGRESSION MODELS

Table D-I
Predicted Probabilities of Significant Socio-Demographics from the Logistic Regression Model - Nonbelievers in the Energy Problem

	0-8 grades/ some high school	high school graduate	trade school/ some college	college graduate	graduate work/ graduate degree
Females	.0446	.0407	.0336	.0042	.0062
Males	.1369	.1260	.1055	.0141	.0208

Table D-II
Predicted Probabilities of Significant Socio-Demographics from the Logistic Regression Model - Regulation: Require Home Thermostats to be No Lower Than $65^{o}F$ in Winter

	0-35 years of age	36-50 years of age	51-65 years of age	65 years of age and over
Rural residents	.6533	.7586	.7420	.7730
Urban residents	.5662	.6852	.6659	.7023

Table D-III

Predicted Probabilities of Significant Socio-Demographics from the Logistic Regression Model - Regulation: Require Home Thermostats to be No Lower Than 78°F in Summer

0-35 years of age	36-50 years of age	51-65 years of age	over 65 years of age
.4541	.5000	.3898	.3689

Table D-IV
Predicted Probabilities of Significant Socio-Demographics from the Logistic Regression Model - Regulation: Require Everyone's Home to Pass an Energy Audit

Homeowners	Renters
.6108	.4302

Table D-V
Predicted Probabilities of Significant Socio-Demographics from the Logistic Regression Model - Regulation: Require Utility Companies to Charge Lowest Rates to Low Energy Users and Highest Rates to High Users

0-35 years of age	36-50 years of age	51-65 years of age	65 years of age and over
.2063	.2717	.4144	.3214

Table D-VI
Predicted Probabilities of Significant Socio-Demographics from the Logistic Regression Model - Regulation: Discourage Building Homes Away Towns and Cities to Lessen Travel By Car

	Own Females	Rent Females	Own Males	Rent Males	
Rural Residents	.8421	1.0000	.8667	.6667	0-8 grades/some high school
	.9394	1.0000	.9149	1.0000	high school graduate
	.8857	.8750	.9038	1.0000	some college/trade school
	.9000	1.0000	.8500	---	college graduate
	.9091	1.0000	.7083	1.0000	graduate work/graduate degree
	Own Females	**Rent Females**	**Own Males**	**Rent Males**	
Urban Residents	.7500	---	.8000	.6667	0-8 grades/some high school
	1.0000	.6250	.8000	1.0000	high school graduate
	.8947	.7273	.7955	.7000	some college/trade school
	.5385	0.0000	.7600	0.0000	college graduate
	.8947	.5714	.5278	0.0000	graduate work/graduate degree

Table D-VII
Predicted Probabilities of Significant Socio-Demographic from the Logistic Regression Model - Regulation: Change Building Codes and Mortgage Requirements to Encourage New Types of Energy-Saving Housing

0-35 years of age	36-50 years of age	50-65 years of age	65 years of age and over
.0746	.1204	.1429	.0614

Table D-VIII
Predicted Probabilities of Significant Socio-Demographics from the Logistic Regression Model - Regulation: Require Land Developers to Have Energy Plans as Part of Their Developments

Males	Females
.2016	.1026

Table D-IX
Predicted Probabilities of Significant Socio-Demographics from the Logistic Regression Model - Low Degree of Internality

	0-8 grades/ some high school		high school graduate		trade school/ some college		college graduate		graduate work/ graduate degree	
	Own	Rent	Own	Rent	Own	Rent	Own	Rent	Own	Rent
$9,999	.8045	.7185	.7408	.6393	.6242	.5074	.5454	.4267	.4086	.3000
$10,000 to $19,999	.7477	.6476	.6730	.5607	.5446	.4259	.4635	.3489	.3322	.2358
$20,000 to $29,999	.6646	.5513	.5791	.4605	.4443	.3315	.3662	.2638	.2496	.1710
$30,000 to $39,999	.6317	---	.5437	.4249	.4091	.3004	.3334	---	.2236	---
$40,000 to $49,999	---	.5234	.4327	---	.3072	---	.2426	.1657	.1557	---
$50,000 and Over	.5945	---	.5045	---	.3717	.2684	.2994	---	.1975	---

APPENDIX E

DELPHI PANEL RESULTS

Delphi Panel Results

Regulation	001	002	003	009	011	012	013	014	015	017	018	019	021	022	023	024	026	027	029	030	Panel Average
	Respondents																				
Require home thermostats to be no higher than 65°F in winter	1	2	2	3	3	4	2	2	2	2	1	3	2	10	2	2	1	6	1	2	= 53/2.66
Require home thermostats to be no lower than 78°F in summer	2	6	9	4	4	5	7	3	5	11	11	7	3	9	3	6	7	5	2	4	= 113/5.65
Require everyone's home to pass an energy "audit" (must have adequate insulation, double-pane or storm windows, etc.)	3	1	3	1	2	1	1	1	1	1	2	2	1	1	1	1	2	1	3	1	= 30/1.50
Provide larger tax credits for improving home energy efficiency	8	10	11	10	10	10	10	11	10	6	8	8	10	6	9	10	10	10	8	10	= 185/9.25
Provide larger tax credits for adding home solar heating or cooling	9	9	10	9	9	9	11	10	9	5	9	9	9	5	10	9	11	9	9	9	= 179/8.95
Require utility companies to charge lowest rates to low energy users and highest rates to high users	4	3	7	6	8	3	4	7	4	4	3	1	4	2	7	3	3	2	7	3	= 85/4.45
Discourage building homes away from towns and cities to lessen travel by car	5	7	1	5	5	6	6	6	7	3	4	6	6	3	4	5	5	4	6	6	= 103/5.00
Change building codes and mortgage requirements to encourage new types of energy-saving housing	7	4	5	2	1	2	3	4	3	8	6	4	7	7	5	4	4	3	4	5	= 88/4.40
Require utilities to provide regular reports to users on whether energy use is higher or lower than in previous years	11	11	6	11	11	5	9	9	11	10	10	11	8	11	8	11	8	11	10	11	= 193/9.15
Rely on state instead of federal programs to encourage energy conservation	10	8	8	8	6	11	8	5	8	7	7	10	11	4	11	8	9	8	11	8	= 166/8.30
Require land developers to have energy plans as part of their developments (e.g., solar orientation on building sites; solar access; landscaping, etc.)	6	5	4	7	7	8	5	8	6	9	5	5	5	8	6	7	6	7	5	7	= 126/6.30

Delphi Panel Ranking Results/Averages