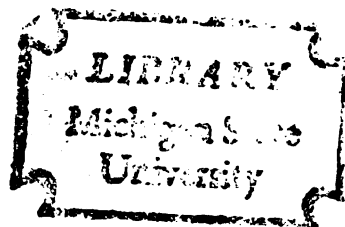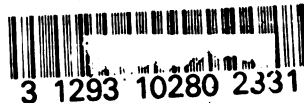ENERGY CONSERVATION: FAMILY VALUES, HOUSEHOLD
PRACTICES, AND CONTEXTUAL VARIABLES

Dissertation for the Degree of Ph. D.
MICHIGAN STATE UNIVERSITY
MARY JANICE HOGAN
1976

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Mary Janice Hogan

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of the requirements for

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_____
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ABSTRACT

ENERGY CONSERVATION: FAMILY VALUES, HOUSEHOLD PRACTICES, AND CONTEXTUAL VARIABLES

By

Mary Janice Hogan

Adoption of energy conservation practices was viewed as desirable family managerial behavior in an era when finite resources were assessed to be incapable of meeting high consumption levels on a sustained basis. The family, a principal social unit in which values are internalized and patterns of energy consumption are learned, was the unit of analysis. The primary objective of the research was to determine if there were differences in the adoption rate of household energy conservation practices among families with varying husband-wife patterns of congruency and commitment to values.

The values included in the study were self-esteem, familism, social responsiveness, and eco-consciousness. Nine types of family value configurations were conceptualized based on combinations of husband-wife positions in the distribution of sample scores: above the mean, around the mean, or below the mean. The purpose of the intrafamilial value typology was to capture the interaction effects of family members' behavior, i.e., synergetic behavior of family.

A scale of 14 practices was used to measure the adoption rate of household energy conservation practices. The family score

for practices was basically a percentage of practices adopted based on husband and wife responses. Contextual variables were also studied in respect to adoption of practices and intrafamilial value patterns. The sets of relationships among the variables with meaningful correlations were used in building a conceptual model of family management using an ecosystem perspective.

Survey data collected during May-June 1974 in a multistage probability sample of the Lansing Standard Metropolitan Statistical Area were used. A subsample of 157 families was selected from the larger study, Michigan Agricultural Experiment Station Project 3152, "Functioning of a Family Ecosystem in a World of Changing Energy Availability." Reliability was established for each of the value scales and the energy conservation scale with alpha coefficients. The coefficients, which ranged from .74 to .89, were a measure of internal consistency of the scales. In a test of the difference between two dependent means, the husbands' and wives' scores were not found to be significantly different on the four value scales, i.e., the scales were not biased by sex role.

The results of the analysis indicated that the value of eco-consciousness is a meaningful predictor of energy conservation behavior. In families where the husband and wife had a high commitment to eco-consciousness, they were high adopters of energy conservation practices. The eco-consciousness value was conceptualized to measure the interrelationship of human beings and the physical environment and contained an explicit "scarcity of energy resources"

component. There was no systematic relationship between conserva-
tion behavior and contextual variables--education, occupation,
employment status of wife, age, family size, income, and urban-
rural residence. The intrafamilial value patterns of social
responsiveness and eco-consciousness were related to selected con-
textual variables. Social responsiveness had a positive relation-
ship with husband's education, wife's education, and family income.
The commitment and congruency levels of eco-consciousness were
positively related to husband's education, wife's education, and
husband's occupational prestige.

The values of self-esteem and familism were not significantly
related to adoption of conservation practices or contextual varia-
bles. The major statistical procedures implemented to test the
hypothesized relationships and differences included one-way analysis
of variance, analysis of covariance, multiple classification analy-
sis, and multiple regression.

Based on the finding that eco-consciousness value is posi-
tively related to the adoption of energy conservation practices
and the linkage between education and eco-consciousness, it is
recommended that educational programs explicitly examine this value.
For example, the capacity of the earth to furnish resources and to
assimilate wastes could be assessed in respect to the demand brought
about by alternative family consumption patterns. And, the costs
and benefits of high and low commitment to eco-consciousness could
be estimated and technical information included which would assist

family members in adjustment of consumption practices and rescaling of values.

Further research was recommended to study the effect of intrafamilial value patterns on outcome behavior. For example, is consensus-dissensus of social responsiveness in families related to their level of participation in public policy decisions at the community level? The exploration of changes in indirect energy consumption patterns is another recommended area of research. Do families perceive the relationship between scarce energy resources used for production, transportation, and distribution costs of food, appliances, etc., and consumer demand? How are the values of thrift and eco-consciousness related to adoption of indirect energy consumption patterns?

ENERGY CONSERVATION: FAMILY VALUES,

HOUSEHOLD PRACTICES, AND

CONTEXTUAL VARIABLES

By

Mary Janice Hogan

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ii

TABLE OF CONTENTS

Page

LIST OF TABLES

viii

LIST OF FIGURES

CHAPTER I

INTRODUCTION

The energy shortage attracted the attention of United
States families during the winter of 1973-74 as they experienced
gasoline lines and increased utility prices, and debated the effects
of the Arab oil embargo. These events signaled the termination of
cheap and abundant energy from fossil fuels and for the first time
many families were aware of the linkage between mechanical energy
supplies and levels of living.

Present consumption patterns in the household sector of
the economy use two-thirds of all U. S. energy consumed (Hannon,
1975). In direct use, most families consume energy for a central
heating system, water heater, range, refrigerator, washing machine,
lighting, and automobiles. Though electric toothbrushes, stereos,
lawnmowers, and hair dryers do not use large amounts of energy in
operation, they require energy for manufacturing and distribution
processes, i.e., indirect energy. The combined direct and indirect
energy consumption data reveal that the major portion of energy is
ultimately consumed by the family unit. Thus, any significant move-
ment toward decreased energy supplies nationally will necessitate
shifts in family consumption patterns.

1

The basic constraints on the present high consumption life style include: the finite supply of renewable energy resources, the capacity of the earth to assimilate wastes, and the net cost of substituting mechanical energy for human and solar forms of energy. Analysis of the physical principles that govern the universe gives evidence that the existing patterns of high energy consumption cannot be sustained indefinitely (Odum, 1971; Koenig and Edens, 1975).

While the U. S. contains 6 percent of the world population, it consumes 30 percent of the world's annual energy budget (Energy Policy Project of the Ford Foundation, 1974:5). Calculated in energy units per capita, the U. S. consumes 9500 units in comparison to 1072 for Mexico, 8 in Nepal, 5140 in Sweden, and 7870 in Canada (Fritsch and Castleman, 1974). The U. S. family is the highest user of mechanical energy of any in the world.

The U. S. level of consumption and standard of living, i.e., desired level of living which includes consumption as one component, will need to be reassessed and adjusted to reflect physical principles that govern our universe as well as issues of equity and equality. Are the societal values of individualism, independence, and mastery-over-nature linked to current consumption levels?

Twenty years ago Cottrell (1955) recognized that the preservation of values in social systems is related to availability of energy. He stated:

> The preservation of a system of values requires a continuous
> supply of energy equal to the demands imposed by that sys-
> tem of values. Conversely, . . . changes in the amount or
> form of energy available give rise to conditions likely to
> result in changes in values, for men who share common values

make similar changes in choice when faced with similar
changes in the consequences of their acts (p. 4).

Given the current awareness of finite energy resources, there is
need to reassess values and resource use.

The family is an energy driven system. It is regarded as
a principal environment in which values are internalized and patterns
of energy consumption are learned. Families are a critical mana-
gerial unit because they make decisions about energy expenditures
and participate in the public debate about energy conservation
policy. Because the family is a mediating link tying the individual
to the larger ecosystem and because the aggregate of families form
the structure of society from which all other social institutions
draw their component units, alternative futures are linked to family
socialization and consumption processes.

Conceptual Framework

A management conceptual framework will be used in this
study of families. The managerial theory focuses on patterns of
decision making motivated by scarce resources and interdependent
utility functions. The focus will be on the family as a unit rather
than individual family members.

Values and their function as motivators of conscious
behavior are basic concepts in the managerial framework. According
to Paolucci (1966):

> Management seems to be motivated by the perception of a
> conflict situation: when home members note that the values
> held by individuals within the household are in conflict
> with those held by individuals both inside and outside the
> home; when what is being accomplished is not consistent with

what the group believes it ought to be accomplishing; when
there is disparity between goals and goal achievement
(p. 339).

Some leaders in the field of family management have classi-
fied values as part of a psychosocial or personal conceptual organi-
zation and defined decisions regarding resources as part of the
managerial framework (Gross, Crandall, and Knoll, 1973; Deacon and
Firebaugh, 1975). These leaders have, however, included values as
a key concept in management theory. According to Deacon and Fire-
baugh (1975:140), "Values provide the underlying meanings that give
continuity to all decisions and actions."

Values are held to be a directive element in decision
making. Gross, Crandall, and Knoll (1973) state:

> Motivation for management comes fundamentally from a
> variety of sources both without and within the family
> . . . Key concepts in understanding motivation within
> the person and the family are values and standards and
> the closely related concepts of goals (p. 112).

While values are assumed to guide choice, there is little empirical
work to support this generalization.

Decisions motivated by multiple goals and scarce resources
are accepted by authorities in family management as central concepts
in the management framework. According to Deacon and Firebaugh (1975:
157), "Resources are the supply reservoir for use in the system's
specific actions, and are necessary in some form to solve every
management problem."

In discussing the kinds of decisions motivated by normal
conflicts in the family, Paolucci linked values to social decisions
and scarce resources to economic decisions (1966). She stated:

> Social decisions are made when there is a conflict in
> values, goals, or "duties" (roles) among family members
> or between those held by the family and by other social
> groups, such as peers, occupation groups, the school, or
> the neighborhood. Economic decisions are evoked when the
> goals of the home members compete for scarce resources
> (p. 339).

Recently, the ecological approach has been proposed to study family management behavior (Steidl, 1969; Hook and Paolucci, 1970). From an ecological perspective, all parts of the family system are linked to each other; values are interrelated to resources through energy flows. A change in one part of the system will produce a change in all other parts, given enough time for the processes to transmit signals and enough magnitude for the change to transmit itself through the linkage network.

This approach raises questions about the directive force of values in decision making. From the ecosystem perspective, value change may be precipitated by availability of resources and decisions about resource use may be directed by dynamic value systems.

The system concept of causation was examined by Bates and Harvey (1975). They state:

> In the systems approach there are no dependent and inde-
> pendent variables. There are no causes or sets of causa-
> tive factors. There is, instead, simultaneous universal
> responsiveness among parts, so that they act together as
> an unfolding operation of parts functioning in relation
> to one another as a whole. . . . In the broadest sense,
> the systems perspective takes the view that it is the way
> the elements of a system are organized in relation to
> each other that accounts for the events occurring within
> the system, and between it and its environment (p. 31).

This point of view suggests that if the hierarchy of values of the family system was to change or alter in organization, then use of resources would change. Conversely, if change in resource availability was of sufficient magnitude, values would be reorganized once enough time had lapsed for the system to process the effect. It is the movement in this set of relationships that is presumed to account for changes in the family system.

According to Williams (1970), the stability or continuance of a family, in part, rests upon consensus of values. He stated that family values "are not independent of the societal context of support or stress, abundant or scanty resources." And, he proposes that values will change as basic life-sustaining and life-threatening conditions change. Thus, the family is viewed as a relatively open, adaptive system of interacting personalities, linked to other social systems and the environment through energy flows.

In an effort to contribute to building a symbolic model of family management, relationships among values, contextual variables, and adoption of energy conservation practices will be studied. Intrafamilial value patterns and household energy conservation indices will be developed. Rather than isolate the demographic variables and values which will predict variation in practices, from the systems perspective, linked relationships will be identified. According to Bates and Harvey (1975):

> . . . the systems perspective focuses on trying to isolate
> the means by which the behavior within the system and
> between it and its environment are produced, rather than on

isolating the variables which will predict or "statistically account for" the variation in one or another variable (p. 32).

The principal contribution of this study will be in theory building. The model of family ecosystem management can not be tested without developing linkages between system concepts. Although no set of linked concepts can be completely understood separate from other linked system concepts, the holist model can only be built with empirical support from the existence of relationships among variables.

In their role as educators, home economists need information about decisions requiring changing amounts of energy for implementation. They are charged with responsibility to assist families in assessing alternative managerial patterns regarding scarce resources and resolving value conflicts which emerge from new resource constraints (Paolucci and Hogan, 1973). This research contributes baseline data on energy conservation practice adoption, value commitments and congruency, and the linkage of values, practices, and contextual variables to assist in developing educational programs.

Statement of the Problem

Energy conservation is viewed as necessary management behavior in a country where finite energy resources are assessed as incapable of meeting consumer demand on a sustained basis. Since energy is a fundamental resource used by families to reach goals, changes in the amount of energy available will affect family management. Remarkably little is known about families' adoption rate of

energy conservation practices. What values are linked to energy conservation? What is the relationship between incongruent family values and adoption rate of energy conservation practices? Are education levels, stages of family life cycle, occupation, and other contextual variables closely linked to values and energy conservation practices?

The primary purpose of this research is to determine if there are any differences in the adoption rate of household energy conservation practices among various intrafamilial patterns of values. The values to be investigated are self-esteem, familism, eco-consciousness, and social responsiveness.

Secondary purposes include testing the rate of adoption of energy conservation practices in relation to contextual variables and investigating the differences in levels of education, occupation prestige, income, and other contextual variables among the intrafamilial value patterns. The sets of relationships among these variables with the greatest magnitude will be identified to assist in building a conceptual model of family management using an eco-system perspective. The model is schematically presented in Figure 1.

Research Objectives

1. To determine if there is a difference among the intrafamilial patterns of values--self-esteem, familism, social responsiveness, and eco-consciousness--in adoption of energy conservation practices.

HOUSEHOLD
ENERGY
CONSERVATION
PRACTICES

FAMILY VALUES

Self-esteem
Familism
Eco-consciousness
Social responsiveness

Is there a difference among
intrafamilial value patterns
in adoption of energy con-
servation practices?

Is there a relationship
between adoption of
energy conservation practices
and contextual variables?

CONTEXTUAL VARIABLES

Education   Income
Occupation   Family Size
Family Cycle   Age

Is there a difference among
the intrafamilial value
patterns with respect to
contextual variables?
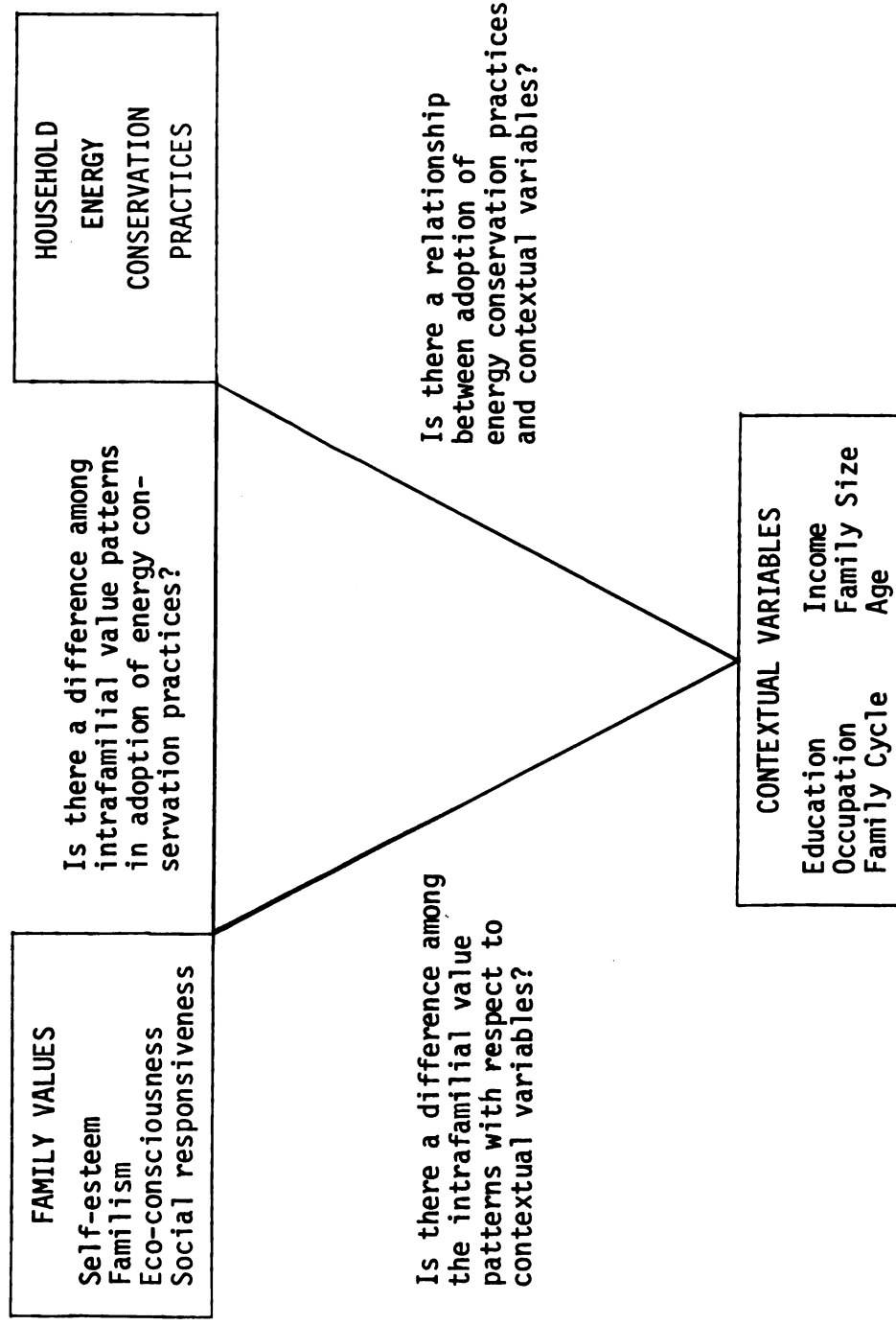
Figure 1.--Model of Variables for Research Study.

2. To determine if adoption of energy conservation prac-
tices varies with contextual variables--occupation, education, and
age of husband; employment status, education, and age of wife;
family size, income, stage of family life cycle, and urban-rural
residence.

3. To determine if there is a difference among the intra-
familial patterns of values--self-esteem, familism, social respon-
siveness, and eco-consiousness--with respect to contextual variables.

Assumptions

1. Values of family respondents can be identified using
self-administered scales.

2. Husbands and wives can accurately assess and record
the changes in household energy conservation practices adopted by
members of the family.

Definitions

Values: A generalized and organized conception of a pref-
erence field, resulting from transactional interplay of physical-
environment, nature of man, and interhuman relations; explicit or
implicit concepts of the desirable. The basis of the definition is
elaborated upon in Chapter II. The specific values are defined as:

1. Self-esteem: Respect that a person has for self,
includes recognition of self-limitation and growth
potential, overall judgment of worth or competence as
a person;

2. <u>Familism</u>: Perception a family member has of his

family unit and level of integration of its members within

the unit; family as a social group;

3. <u>Social responsiveness</u>: Bonding with larger social

structure, interdependence of person-society, degree of

integration into society;

4. <u>Eco-consciousness</u>: Interrelationship of man-

nature, interlinked with earth's capacity to sustain

life style of man.

<u>Energy conservation practices</u>: Activities which directly

use mechanical energy in the household. Excluded are indirect uses

of mechanical energy and use of solar and human energy.

CHAPTER II

REVIEW OF LITERATURE

Research and related literature will be reviewed in three major sections--approaches to the study of values in family management, the relationship between values and practices, and contextual variables and energy conservation practices related to functioning of a family ecosystem.

Approaches to the Study of Values

Philosophers and social psychologists have written extensively about values in an attempt to clarify the role of values in directing human behavior. According to C. Kluckhohn (1954:390), "the only general agreement is that values somehow have to do with normative as opposed to existential propositions."

In a comprehensive study of operational definitions of values by researchers, Handy (1970) supported Kluckhohn's observation of conceptual diversity. He proposed that there is not one valid measure of values or one scale of universal importance to be discovered, but rather various aspects of value transactions to be measured using different techniques.

Several researchers have included the transactional property in their approach to studying values. F. Kluckhohn and Strodtbeck

(1961) defined value orientations as patterned principles resulting from transactional interplay of cognitive, affective, and directive elements of the valuation process. C. Kluckhohn (1954) linked values to nature, i.e., man-nature transactions, cultural conceptualizations of nature. He defined values as concepts of the desirable, normative criteria by which human beings are guided in their choice among alternative courses of action.

It is the transactional property of values that brings about changes in values over time. According to participants attending the National Institute of Child Health and Human Development Conference (1968:50):

> Protean man seeks values not because he lacks values but because he must find new values suitable for the changed and changing world in which he lives. Renaissance man was a kind of protean man, yet perhaps the reason he was different from today's protean man, and his values were different, is because values are always in context. Essentially values mean relationships to things and to people.

Rescher (1969b) theorized that value change is linked to the finiteness of resources and identified conditions stimulating value change. He stated:

> . . . values can come into conflict with one another, not of course in the abstract, but in the competing demands their realization and pursuit make upon man's finite resources of goods, time, effort, attention, etc. Thus when a change occurs in the operating rationale that constitute the operative framework within which a value is pursued in a given society, we may expect a series of stresses upon our scale of values militating from a rescaling in their ordering or a change of the value standard, etc. (p. 76).

Rescher proposed that stresses brought about from reduced supplies of resources will influence value changes.

Williams (1970) also proposed that patterns of values in families are dependent on stocks of available resources and will change as basic life-sustaining and life-threatening conditions change. The characteristic of interdependence implies that the family system is acted upon by the environment, acts on the environment, and reacts to the environment.

Two approaches to measuring values can be distinguished in reviewing the literature: expressed and revealed concepts of the desirable. Some scholars focus their study of values on the expressed measure of values by analyzing verbal or written statements of "what ought to be." In discussing this method of measurement, Rescher (1969a:2) indicated that it is assumed that the respondent would take the value into proper account in making decisions.

The second approach to measuring values, revealed preference, is derived from economic theory and is based on analysis of choice or decision outcome in the marketplace. According to Boulding (1969), the preference field of a person is made up of a set of possible exchanges with known resource constraints in the form of prices and from observing responses to different choice situations, values are revealed. Thus, it is assumed that values can be inferred from observed behavior.

Values as revealed preferences may be adequate for application to some problems and some types of data. However, the question of whether the researcher is observing a concept of the desirable or heuristic decision making creates certain problems.

Jacob and Flink (1962:20) critique this approach to measuring values
and suggest that inferring values from short-term overt behavior
masks the property of stability inherent in basic values. They
state:

> Values can and do change, though they have a strong hold
> upon most human beings and constitute a relatively stable
> component of the personality (p. 15).

Rokeach (1974) used the expressed preference approach to
measure value stability in a national survey research project over
a three year period, 1968-71. He classified values as terminal,
i.e., ideal end-states of existence, and instrumental values, i.e.,
ideal modes of behavior. He reported:

> The composite ranking of the terminal value a world at peace
> was first in 1968 and first again in 1971; family security
> was second and freedom third on both occasions; an exciting
> life, pleasure, social recognition, and a world of beauty
> were at the bottom of the national sample's terminal value
> hierarchy in both 1968 and 1971. For both years, the most
> important instrumental values were honest, ambitious, and
> responsible; the least important were imaginative, logical,
> obedient, and intellectual (p. 225).

Rokeach proposed that values specifically related to societal issues
undergo measurable change and other values remain relatively stable.
For example, he found that for American women family security became
significantly less important in 1971, and equality and being logical
significantly more important. Changes in women's values may be
related to the national issue of women's societal role.

The extent to which the observed value changes were a
function of education, income, or age were also tested in the
Rokeach study. Only age was a significant determinant; the younger

adult respondents showed considerably more changes than older adults. According to Rokeach (1974:231), the significant value changes found for persons beyond the thirties are few in number and could easily have arisen by chance.

The importance of the Rokeach study is its quantitative monitoring of value change and stability in a national area probability sample. Survey research has been used to assess attitude changes over time, but not with the measurement of values. While attitudes may be used as predictors, values encompass more basic objectives and are general predictors of behavior (Nye, 1967).

A question critical in investigating values is the unit of analysis. While it is very appropriate for some disciplines to study values of individuals to predict economic, social, and political trends, scholars of the family give empirical attention to familial values.

Can either the husband or wife accurately describe the value base of family members or the "family" value hierarchy? The adequacy of interviewing a single family member has been debated in recent literature (Granbois and Willett, 1970; Safilios, 1969; Turk and Bell, 1972). In general, authors conclude that there are few differences when aggregated responses for husbands and wives are compared, but important differences are revealed when spouses' answers are compared.

Williams (1970) proposed that the family as a social unit does not have one value system which commits each of its members to

a single concept of the desirable. Rather, the family has a pattern of values which reflects variability of commitment among members. He suggested that diverse value systems may result in conflict, active dissent, or covert opposition in decision making behavior of family members. Williams stated ". . . value-concensus does not guarantee family harmony, nor does dissensus necessarily lead to a high level of conflict." He concluded that family scholars have little systematic information to predict the effects of congruency levels in families.

One of the early research studies to investigate intra-familial value patterns was conducted by Cutler (1947), a home economist. Included in the sample were all persons over 10 years of age living in the household. She used a measure of expressed values--beauty, comfort, convenience, location, health, personal interests, privacy, safety, friendship, activities, and economy-- and administered the instrument to the family members independently.

Cutler found that family members were more likely to agree on the most important and the least important values than on values of intermediate importance. The correlations between values for the husbands and wives were .36, .38, and .55 for the upper class, middle class, and lower class respectively. The correlations were higher for mothers and children than for fathers and children. The higher the socio-economic group, the less similarity between fathers and children--.11, .35, and .31 respectively. There was no signifi-cant difference for mothers and children among the socio-economic

levels--.39, .42, and .37 for high, medium, and low status groups respectively. The sample size was too small to generalize the findings of the heterogeneous group of families.

In a more recent study, Martin (1965) studied values in 51 families to construct profiles reflecting value similarities. The families were comprised of two parents and children between the ages of 12 and 18. A value typology developed by Engebretson (1965) was used to classify individual values according to four types: social, change-prone, traditional, and autonomous. Martin reported that husbands' profiles were about equally distributed between autonomous--emphasizes growth and development, fairness, impartial- ity, and responsible inner-direction--and traditional--emphasis on production, duty, rights and responsibilities, and security. Wives' profiles were largely autonomous. Father-daughter and mother- daughter had the most profiles alike; mother-son pairs had the fewest similar profiles.

The major contribution of the Martin study was in assessing the value hierarchies of family members to determine similarities and to empirically support the margin of error when one family member is used as the spokesperson for the family value system. She con- cluded that no one person can be the indicator of values for the entire family. She recommended research to study decision outcome of different combinations of values in the family. Because the study had a nonprobability sample, generalizing the findings was limited.

Strodtbeck (1958) studied intrafamilial values of Jewish and Italian families in relation to social mobility using a revealed differences instrument. The family members individually completed responses to nine value stimuli items and the revealed differences were resolved collectively. The final choices became the "family" value hierarchy. The Strodtbeck study found three values in the hierarchy related to socio-economic achievement in the United States: mastery-over-future, individualism, and low commitment to familism. He found that the Italian stress on "familism" contributed to the lower occupational achievement of Italians as compared with Jews.

The Strodtbeck study broke new ground both theoretically and empirically in the study of values in the family. The values tying the family to the larger social system were empirically supported and the role of family in the socialization process was made explicit. Finally, the study provided an alternative method of testing family theory regarding the production of human capital in relation to the valuing process.

A number of studies of homemaker's values have been conducted with the wife as respondent. Ketchum (1961) compared wives' values, measured by rank order and forced choice tests of expressed preference, to a one-day recall of activities to determine the level of awareness of value content in their role as homemaker. A low correlation between expressed values in tests and revealed values in activity recall gave empirical support to the theoretical

difference in measuring values. As discussed earlier, there is a limitation to identifying values from short-term revealed behavior.

Dyer (1962) conducted a study of three techniques to rank values: projective stories, rank order test, and Q-sort of activity recall. The correlations between tests varied from .51 to .80, with the highest correlation reported between the projective stories and Q-sort of expressed preference in activities. The researcher questioned the validity of the rank order test in identifying values. It may be that Dyer's measures identified both revealed and expressed preferences.

Reflecting on the studies reviewed, there are alternative methods in the measurement of values. The contrast between measuring overt or revealed behavior and expressed preference need not be viewed as an "either-or" situation, but determining what aspect of valuing behavior is to be measured. As Handy (1970) so clearly stated:

> All the various forms of behavior may be worth studying. For example, assume that a given individual responds to a questionnaire in terms of the "self-image" he has and that such responses diverge considerably from the behavior he shows in other settings. For some inquiries, it might be precisely such "self-images" that are of interest and quite possibly reliable information about them will help predict some types of behavior. So in that instance disparity between verbalized statements of preference and some other evincing of preference will not matter. Sometimes, indeed, what is marked on a paper may be exactly what is most important; in an election, who is elected depends on what choices are made on the ballot, not the "inner feelings" of the voters (p. 200-201).

In sum, the basic statement of theory from studies of intra-familial values is that there appears to be a network of

common values and also dissimilar values. Do families sharing similar values advocate similar responses in managerial situations? And conversely, do members with generally dissimilar values advocate different responses? If family behavior is a function of the content and the degree of similarity of value systems, the direction and congruency of intra-familial values will produce variance in decision outcome.

Relationship Between Values and Practices

The study of values in family management has received continued empirical attention from scientists since the benchmark conference, "Values and Decision-Making in Home Management," nearly two decades ago. In an introductory statement at the conference, Gross (1955) stated: "Values, if not synonymous with motivation of management, underlie it." Many of the studies which followed have focused on the linkage of values with decision-making, planning, resource use, and implementation processes (Eigsti, 1973; Fortenberry, 1963; Johnson, 1962; Meeks and Deacon, 1972).

According to Gross, Crandall, and Knoll (1973:346-351), most of the family management studies have focused on describing processes, not the results or consequences of managerial action. They suggest that one of the output units that could be measured is adoption of practices or activity analysis.

Decision implementation was supported as an area of management which should receive attention by Schlater (1967). She stated that the goal-directed activities include carrying out a series of

decisions, i.e., decision implementation, under conditions of uncertainty and with limited resources.

Adoption of practices is classified as output related to values in most managerial models. However, concepts of decision making and goal achievement are intervening variables. According to Deacon and Firebaugh (1975):

> Management processes lead to extrinsic values by meeting as nearly as possible the goals that are value based . . . A managerial activity may serve one or more values at any level of generality or specificity. A decision may be complex because more general or underlying values influence the goal choices (pp. 144-145).

They indicate that values that are held to be generally important may not be important in every decision situation. The more basic or general the values, the more they are linked to general rather than specific action situations. Thus, the content of values varies from general to specific, and may require different actions over time to fulfill.

The quesion of which values and managerial practices to investigate may be related to the conceptual framework used for research. Using an ecosystem framework, Bredemeier (1973) cited characteristics from which value content can be inferred. He noted that human beings are interdependent with one another, both in the development of human resources and the division of material resources. Values and cognitions that underlie choice are capable of great variation and the consequences of differential predispositions can be measured from Bredemeier's perspective. He suggested

that the purpose of social science research is to study distributive
justice, i.e., the sharing of scarce resources.

In a study of family consumption of water, Field (1973)
used an ecosystem perspective and gave attention to predicting
adoption of practices from values. She collected water use data
from 100 middle class families living in a Michigan urban subdivi-
sion. Field hypothesized that conscious attempts to conserve water
were related to the beliefs in fate held by the husband and wife.
The measure of beliefs developed by Brim, et al. (1962:54-57)
included value orientations similar to F. Kluckhohn and Stodtbeck's
(1961) concepts: control over destiny, future-present time orienta-
tion, and optimism-pessimism reference.

Field found no support for the relationship between values
and practices. She concluded:

> Belief in fate did not appear to be related to the amount of
> water used nor to attempts to conserve water. It may be that
> those who believe, not in fate but rather in their own ability
> to control what happens in their lives, do not view the use
> of water as an area in which they could or should try to exer-
> cise control (p. 69).

The results of the Field study suggested that families did not
perceive water as a scarce resource, and therefore were not moti-
vated to adjust their practices to conserve water. The amount of
water that families used was related to their socio-economic status
--income, education, occupation, and area of residence--and to their
stage in the family life cycle.

Kimball (1960) studied the relationship between husbands'
and wives' value patterns and the adoption of innovative household

and farm practices. Data were collected in a stratified sample of
farm families. The 53 couples in the sample completed a forced
choice value test used by Cutler (1947) and responded to questions
regarding the adoption of role related practices. Kimball reported
one value, family life, was positively related to the husband's
adoption of farm practices; the values of recognition and religion
were negatively related to practice adoption of farm practices. For
the wives, he found the value of helpfulness positively related to
adoption of innovative household practices; recognition and freedom
were negatively related values to practice adoption for the aggre-
gate of wives.

Kimball hypothesized that the more similar the intra-
familial value patterns, the more practices they would have adopted.
He found a curvilinear relationship: very low practice adoption
was associated with very dissimilar value patterns for the husband
and wife; as intrafamilial value similarity increased, the total
practices increased, but only to a point, beyond which greater
similarity appeared to have a negative effect on adoption. The
Kimball study's major contribution was in testing the intra-
familial values in relation to behavioral output.

The Field and Kimball studies provided insight into the
family's adoption of innovative practices. In sum, there was support
in the Kimball study and no support in the Field study for linkages
between values and practices.

The work by Rogers and Shoemaker (1971) is related to the
adoption of practices cross-culturally and provides additional

insight for the current study. Their model includes four processes: knowledge, persuasion, decision, and confirmation. While values could be classified as an antecedent variable and adoption of practices a consequence of the processes, the researchers point out that nonadoption or rejection of the practices may also be the outcome of the decision process.

Some of the generalizations that Rogers and Shoemaker (1971:Appx.) reported with empirical data were: early adopters have more education, high social status, more social participation, and are more highly integrated with the social system than later adopters; early adopters are no different in age from later adopters. While the authors do not include the study of values specifically as one of the antecedent variables, several of their measures of behavioral phenomena approximate the transactional properties of values. For example, participation and integration into the larger social system are indicators of the value of social responsiveness. In sum, the Rogers and Shoemaker comprehensive review of the research revealed empirical support for some of the contextual and behavioral variables linked to adoption of practices.

Energy Conservation Practices

Conservation of resources has remained an important concept in family management over time. However, the particular resources that have been perceived as scarce have changed. Gross, Crandall, and Knoll (1973:172-173) traced historically the scarcity of material goods in the early stages of industrialization. They identified the

limited time and human energy emphasis in an era of affluence and raised questions about the outcome of "use-and-throw-away" consumption patterns.

A number of research studies have focused on the conservation of mechanical energy in the past two years. Those studies which investigated family consumption patterns will be discussed in terms of implications for managerial behavior change.

The Warren (1974) study reported that most households had adopted some practices to conserve energy during the energy crisis winter of 1973-74. In an interview survey of 766 household respondents in Detroit area suburbs, approximately 83 percent of the respondents said they had lowered home thermostats, turned out lights, or some similar household energy conservation practice. About 20 percent of the sample reported they were not using their car as frequently to go to work and 65 percent had reduced mileage for leisure purposes. Additional home insulation was installed by 9 percent of the families. Only 2 percent of the respondents reported no adoption of energy conservation practices.

Warren concluded that it is necessary to distinguish between energy conservation of gasoline for the car and direct energy for the household. He stated:

> . . . our findings suggest that the short term experience of the energy crisis of 1973-74 was fundamentally a gasoline shortage and that it would be possible to distinguish in the attitudes of individuals their view of the conspiratorial character of those gasoline shortages apart from the view that, in fact, there is a broader question of energy resources and their future availability (p. 84).

Because many of the respondents indicated that the energy crisis was a form of distraction from the political problems of Watergate and equated "crisis" with gasoline shortages, Warren questioned how much control families had in adoption of gasoline conservation practices.

Tests of significance were not reported for any of the findings in the Warren study. This study, an exploratory phase of a proposed four-year longitudinal study, was analyzed with frequency data and some relational coefficients. The insights that Warren reported are helpful in designing future research where probability of error will be tested.

The analysis of socio-economic factors related to practices in the Warren study suggested that the higher the income, the higher the adoption of energy conservation practices--particularly those related to the use of the car. Warren proposed that families with higher incomes were better able to make adjustments in their lifestyle because they had more discretionary resources. The ability of the lower income families to conserve energy was found to be a function of the range of household appliances and transportation resources available. Lower income groups reported energy conservation practices, but the number of practices adopted were fewer than higher income families adopted.

The high adoption rate of energy conservation behavior of families in the Warren study was reported to exceed the expectation of government policy makers. Warren proposed that the explanation

for high adoption of energy conservation practices is linked to values and states:

> The sense that Americans have strayed from the values of the Protestant ethic is something which has been widely discussed and reviewed in the media. We believe its application to the energy crisis takes on the following character: that individuals in the more affluent income groups viewed the problems of the energy crisis as an opportunity to restore a balance in their lives between their fundamental values of self-regulation and restraint and the existing lifestyle of which they had become accustomed (p. 87).

The type of neighborhood--integral, parochial, diffuse, stepping-stone, transitory, and anomic--was used as an intervening variable linked to attitudes and practice adoption. Warren reported that attitude is only a critical predictor of household energy conservation behavior in the presence of the neighborhood variable. He concluded:

> Thus, if people have great distrust in the reality of the energy crisis but many individuals around them are taking action regarding conservation, . . . to the extent that they identify themselves with that neighborhood or community, their behavior may move more in line with these publicly defined norms . . . (p. 88).

Thus, it appears that the family's integration into the neighborhood is a factor in their adoption of practices and may be an important influence in the rate of value change.

Two communities in New York City were randomly sampled during the summer of 1974 to determine the characteristics of families who had adopted energy conservation practices and high energy knowledge. The Kilkeary and Thompson (1975) study selected the communities based on a "blackout" variable. Half of the 602 families resided in Queens and had experienced a weekend without electricity the previous summer.

Kilkeary and Thompson reported the following variables were significantly related to adoption of energy conservation practices: exposure to blackouts, direct payment of utility bills, car ownership, belief in family effort to produce change affecting the energy crisis, income, and family composition. There were nine practices in the conservation measure, four of which concerned use of car and home improvements through insulation and storm windows. Since only 18 percent of the families owned their housing unit and about half of the families owned a car, the limitation of the conservation practices measure is a concern.

The household respondent's knowledge about energy conservation was tested in a 16-item questionnaire administered by the interviewer. Kilkeary and Thompson reported a positive relationship between energy knowledge and car ownership, income, education, and family composition. They concluded that the higher socio-economic families who can afford to pay higher bills are not conserving as much as the moderate income families.

Direct energy use in households was found to be positively related to family income in the Newman and Wachtel study (1974). They reported from a national survey of 1,455 households that the poor use less energy in maintaining their level of living and allocate a greater proportion of income to direct energy costs than higher income groups. The poor families spend about 15 percent of their income for natural gas, electricity and gasoline in comparison to 7 percent for lower-middle, 6 percent for upper-middle, and 4 percent for well-off families. There was little reported

difference in natural gas by income group, greater difference in electricity consumption, and the largest difference in gasoline consumption by family income.

Most of the poor families lived in smaller homes than higher income families, were more likely to live in multi-unit dwellings rather than single structures, and paid proportionately higher energy costs for space heating. Newman and Wachtel reported that about 50 percent of the poor have insulation in their dwellings compared to 95 percent of the well-off; 31 percent of the poor have storm windows compared to 63 percent of the well-off families' homes. Thus, it was not surprising that the study reported high energy costs for low income families one of the most important problems uncovered.

Newman and Wachtel recommended subsidized loans for home improvements in energy efficiency and a system of "energy stamps" to assist in the short-run. Furthermore, they perceived the unequal energy costs as an issue related to the larger problem of poverty.

Studies by Heberlein (1974) and Winett and Nietzel (1975) tested the effects of incentives on energy conservation behavior. Heberlein selected 96 apartment residents for his experimental design research model and used three treatments: information given to respondents on energy conservation techniques; information presented on the negative effects of high consumption to individuals and society; and, the positive effects of high consumption to individuals, thus discrediting conservation behavior. The control group received

no information input from the researchers. No significant differ-
ence was found among the four groups in their direct energy con-
sumption behavior.

Winett and Nietzel offered monetary incentives contingent
on energy conservation of direct energy to 16 families and only
information on energy conservation techniques to 15 families. The
families volunteered for the study in response to newspaper articles
soliciting respondents but information about the monetary incentives
was given only to the one treatment group at the time the study was
implemented. The researchers reported significantly greater reduc-
tions in electricity and no reduction in natural gas for the families
receiving monetary rewards than for the families receiving informa-
tion. The self-selecting sampling procedure used may have attracted
high adopters of conservation practices that were unwilling to
further reduce their consumption of natural gas. Winett and Nietzel
monitored the energy consumption levels at two-week and eight-week
periods after the treatments and reported that the differences in
electricity consumption were maintained between the two groups.

In a study of townhouses in an upper middle class planned
community development, Grot and Socolow (1974) hypothesized that
building materials, exterior exposure, appliance design, space
heating, cooling systems, and other aspects of household technology
would account for the variance in gas and electric consumption.
After exploring the relations between housing structure variables,
considerable variance was left unexplained. Grot and Socolow con-
cluded that life style decisions accounted for the difference

between 800 and 1300 therms consumed by families in like physical household structures. They recommended that behavioral variables be included as predictors of energy consumption. In sum, Grot and Socolow controlled for structural variables and thereby isolated the role of managerial behavior in energy consumption.

Related Energy Research

Several research studies have been reported from the Michigan Agricultural Experiment Station Project, "Functioning of a Family Ecosystem in a World of Changing Energy Availability" (Gladhart, 1975; Morrison, 1975; Eichenberger, 1975; Zuiches, 1975). Each of the researchers chose their sample from a multi-stage area probability sample of 217 families.

Family income was found to be the strongest single predictor of home energy use. Gladhart (1975) reported that families in the upper third of the income distribution used 17 percent more direct energy than did those in the lowest third. While the consumption differential varies in absolute amounts from study to study, in general Gladhart's findings corroborate the Newman and Wachtel study reported earlier.

Morrison (1975) studied a subsample of families living in single family dwellings to predict energy consumption levels. While she included such physical housing variables as number of windows and doors, type of construction materials, and presence of insulation in walls, floors, and ceiling, she found that number of rooms was the best structural housing predictor of consumption levels. Number

of persons in the household was a meaningful family factor in pre-
dicting levels of energy consumption; stage of family life cycle
was not a significant factor. Number of major appliances was also
one of the important variables in consumption.

Family income was not found to be a meaningful predictor of
energy consumption in the Morrison study. She suggested that number
of rooms and number of major appliances are positively related to
income levels. However, the third important predictor, number of
persons in the household, may not lend support to the income theory.

A study of household energy consumption and appliance owner-
ship was conducted by Eichenberger (1975). She reported no signifi-
cant differences in ownership of major appliances among the families
with employment of wife as a variable. Literature proposing
causal factors for the increasing levels of household energy consump-
tion had suggested that employed wives were substituting mechanical
energy for their human energy and time inputs into household work.
The Eichenberger study rejects employment status of women as a predic-
tor of energy consumption levels.

Acceptability of energy policies was the focus of the Zuiches
study (1975). In general, women supported more policies aimed at
energy conservation than men and were more likely to accept energy
shortages as a real problem. The acceptability of policies varied
according to the degree of coercion and mode of implementation
inherent in the policy. Voluntary policies such as more home
food preparation and home gardening, received the highest overall
support from all respondents. Noncoercive redistribution policies

such as tax deductions for home improvements, were acceptable to over 43 percent of the men and women. Further, policies with low acceptance were viewed as coercive regulations and included tax deduction for sterilization, reverse school year seasons, tax deduction for apartment living, and added taxes for large families. Zuiches found that energy awareness was the crucial predictor of policy support, irrespective of level of coercion.

In summary, the effects of family income were reported to be the best predictor of energy consumption levels in the general population. However, among single family dwellers number of rooms, major appliances, and persons in the household explained more of the variance than other physical and socio-economic factors. Employment status of the wife is rejected as a determinant of consumption levels. Families who were most supportive of public policies, irrespective of the cohersive nature of the proposed policy, had a high level of energy consumption awareness.

CHAPTER III

DESIGN OF THE STUDY

This study was undertaken to determine the relationships
among family values, conservation practices regarding energy, and
contextual variables. Data collected in the Michigan Agricultural
Experiment Station Project (AESP) 3152, "Functioning of a Family
Ecosystem in a World of Changing Energy Availability," were used to
answer research questions about the interrelationships. These data
were collected from families during May-June 1974. The current
study was conceived subsequent to data collection and used a sub-
sample from the larger study.

Discussion in this chapter will focus on: (1) sampling and
data collection procedures used in the larger study and selection
of the subsample, (2) development of measures for values and prac-
tices and identification of contextual measures, and (3) data analy-
sis procedures.

Procedures for Sampling and Data Collection

Procedures for AESP Study*

The interview population selected for the AESP was the
Lansing Standard Metropolitan Statistical Area (SMSA), a three

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*Complete information on sampling procedure and sample
description is presented in Agricultural Experiment Station Project
3152 report (Zuiches, Morrison, and Gladhart, 1975).

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county area which contains the state government complex, a large university (Michigan State University), commercial enterprises relating to the automotive industry, and a diversified crop and livestock agricultural sector. The Lansing SMSA provided a heterogeneous population of urban suburban and rural households. The family was defined as two or more related individuals living together, one who was 18 years of age or older.

A multistage probability sample was selected based on census tract information from the 1970 U. S. Bureau of the Census and the 1973 City Directory for Lansing. Random selection of ten tracts out of the possible 62 tracts which were enumerated in the City Directory was made. Each tract had a probability of selection proportionate to the number of households therein. From the ten tracts, a random sample of 39 blocks out of 478 blocks was selected. Later, five blocks which encompassed the University population were dropped because residents did not meet the family criterion. About 20 percent of the population, 615 households was selected. This number included two extra addresses per needed household to allow for screening out of ineligible persons and refusals. Using this procedure, 160 families were selected to represent the urban population.

In the rural area of Lansing SMSA, two townships were randomly drawn from the 12 townships within the three counties which contained no incorporated city or village. The latter criterion for the rural portion of the sample was implemented to maximize the rural character of the respondents at the expense of geographical

completeness. The primary sampling frame in each township was 36 square mile sections with one section being randomly chosen from each row of six. Research assistants mapped and numbered the residences in each of the 12 sections selected. Every second residence was randomly drawn which allowed for replacement addresses. The final sample contained 57 rural families and 160 urban families, a total of 217 families.

Interviewers screened the sample households to determine if the residents met the AESP criteria of a family. Eligible families who completed the self-administered questionnaires and answered the interviewer-administered questions received a stipend of $10.

The self-administered sections of the instrument were given to eligible family members: wife-parent, husband-parent, and oldest child over 12 years living in the household. All eligible respondents completed a series of questions regarding their knowledge, belief, and behavior in regard to energy, food, and interpersonal relationships.

The question of validity of measurement with self-administered portions of the instrument was recognized by the AESP researchers. To minimize collaboration between family members, separate color coded packets of materials were given to each family by the interviewer and independence of response was verbally stressed. Cursory checks were made by the interviewer and AESP director before payment was made to the family. After the data had been coded, the three self-administered sections of the instrument were again evaluated and data from 35 families (16 percent) were found to have handwriting

and answer similarity which suggested possible collaboration on one or more sections.

In order to assess the representativeness of the sample, a comparison was made between the census data and the sample. Comparisons of educational attainment, income level and occupational classification revealed only minimal divergence from 1970 census distributions. Further, the sampling procedure did not underrepresent any significant type of housing or family composition. In sum, the selected sample was found to be representative on a set of contextual variables deemed significant for generalizing to the population (Zuiches, et al., 1975).

Selection of the Subsample

Criteria for selection of the subsample used in this study are: (1) presence of a husband and wife respondent in the family, (2) completeness of data on value and managerial practice variables and, (3) independence of respondent response on value variables.

The first criterion, husband and wife respondents in each family, reduced the sample from 217 to 195 families. Omitted from the sample were 22 single parent households, approximately 5 percent of the AESP sample. Although seven of the single parent families had a child over 12 years old as a second family respondent and therefore value congruence could be measured, the advisability of treating them as a separate group was negated because of the small number and lower socio-economic skewed distribution.

The second criterion, completeness of data, eliminated any family that (1) omitted the managerial practice measure or (2)

if either the husband or wife omitted approximately 10 percent of the items on any one of the value measures.* No families were eliminated on the basis of missing managerial practice data. However, 26 families, 13 percent of the husband-wife families in the subsample, were eliminated because of incomplete value data.

The third criterion, independence of response, further reduced the subsample by 12 families. Rules adopted for excluding families were: if husband and wife had identical responses to all items in a section of the self-administered questionnaire from which one or more value scales were derived; or if the husband and wife had handwriting which appeared to be identical and the same response to 90 percent or more of the items on value scales. Due to a pattern of erasures and checked answers, it appeared that some couples worked together in arriving at a "family" response for the behavioral variables. In other families, one respondent may have lacked the time, interest or literacy level needed to complete his/her questionnaire; the spouse or children may have intervened in the data collection process.

The missing data and collaboration criteria were not always mutually exclusive; five families had missing data and patterns of possible collaboration in their responses. Since the missing data criterion superseded the collaboration criterion, the five dual criteria cases were rejected for missing data. In sum, the subsample of husband-wife families was reduced from the larger study sample as

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*Specific rules for missing data were developed for each of the value scales and are listed in Appendix B.

follows: 26 families rejected due to incomplete data, five of which also had collaboration characteristics; 12 families rejected due to collaboration criterion. The sample used for this study is comprised of 157 husband-wife families.

Description of the Subsample

The composition and developmental stage of families varied widely (Table 1). About three-fourths of the families had children living at home, the majority of whom were school age dependents. Of the families without children living at home (25 percent), an equal number were younger and older families. Stages of the family life cycle are presumed to approximate different developmental stages based on a childbearing and rearing criteria.

TABLE 1.--Stage of the Family Life Cycle of Subsample.

Stage of Family Life Cycle[a]	Number	Percent
Couple, wife under 40 years, no children living at home	20	12.7
Couple, oldest child six years or less	35	22.3
Couple, oldest child seven to 12 years	31	19.7
Couple, oldest child 13 to 19 years	35	22.3
Couple, oldest child 20 years and over	16	10.2
Couple, wife over 40 years, no children living at home	20	12.7
TOTAL	157	100.0%

[a]Reflects composition of family living in household at time of survey.

Only one family reported presence of an extended family
member and one family listed a nonrelative present in the household.
The most frequent household size was four members: wife, husband,
and two children. However, the number of persons varies from two
to nine (Table 2).

TABLE 2.--Size of Household of Subsample.

Number of Members in Household	Number	Percent
2	38	24.2
3	33	21.0
4	45	28.7
5	21	13.4
6	10	6.4
7	4	2.5
8	1	.6
9	5	3.2
TOTAL	157	100.0%

About three-fourths of the respondents were in the 18 to 44
age range (Table 3). Family heads in the 65 years and over age
category were under-represented. While 10 percent of the males and
6.6 percent of the females in the Lansing SMSA married population
are 65 years and over, only about 2 percent of the subsample respon-
dents are categorized in this age group. The AESP sample reported
about twice the representation in the forementioned age group as
the subsample. An analysis of rejected subsample families, discussed
later in the chapter, revealed a dominance of older couples.

TABLE 3.--Age of Husbands and Wives in Subsample.

Age Categories	Husbands Percent N=157	Wives Percent N=157
Under 18 years	0	0
18 - 29 years	35.0	40.8
30 - 44 years	37.6	35.7
45 - 64 years	24.8	21.7
65 years and over	2.5	1.9
TOTAL	100.0%	100.0%

Family income distribution, as categorized in Table 4, closely approximates the AESP sample families. The median income of $13,400 is the same as the AESP reported. A wide range of levels of economic well-being are represented in the subsample.

TABLE 4.--Family Income Distribution for 1973 of Subsample.

Gross Family Income Categories	Number	Percent
Less than $4,999	13	8.3
$ 5,000 to $ 9,999	25	15.9
$10,000 to $14,999	51	32.8
$15,000 to $24,999	45	28.7
$25,000 or more	23	14.6
TOTAL	157	100.0%
Median Income		$13,400

Over 80 percent of the respondents have completed a minimum of a high school education (Table 5). While the median educational level of the population and the subsample are approximately the same, i.e., high school graduate, the proportion of husbands and wives with less than a high school education is less in the sub-sample. Approximately half of the husbands and one-third of the wives have attended college.

TABLE 5.--Educational Attainment of Husbands and Wives.

Years of School Completed	Husbands Percent N=157	Wives Percent N=157
0-11 years, less than high school graduate	17.4	16.6
12 years, high school completed	33.8	47.1
1-3 years college or vocational school	21.3	18.5
4 years or more college, profes-sional training	27.1	17.8
TOTAL	100.0%	100.0%

Occupational characteristics by sex role are presented in Table 6. In comparison to the AESP sample, the subsample under-represents husbands employed in managerial occupations by about 3 percent and blue collar jobs by 4 percent. This occupational deviation is confirmed in an analysis of the rejected subsample and will be discussed later in the chapter.

An analysis of the data for occupation of wives revealed that this concept may be ambiguous. While about 50 percent of the wives

TABLE 6.--Occupation Classification as Defined by Husbands and Wives in Subsample.

Occupation Category	Husbands Percent N=157	Wives Percent N=157
Professional	22.3	11.5
Managerial	7.6	4.5
Clerical-Sales	12.1	33.8
Blue Collar	51.6	8.9
Service Workers and Private Household Workers	3.8	11.5
Homemaker	0.0	20.4
No Response	2.5	9.4
TOTAL	100.0%	100.0%

TABLE 7.--Employment Status of Wives.

Employment Category	Number	Percent
Fulltime: 35 hours minimum	57	36.3
Parttime: 34 hours or less	22	14.0
Not Employed	78	49.7
TOTAL	157	100.0

reported that they were employed (Table 7), 70 percent gave a labor market category as their occupation (Table 6). About one-fifth of the subsample wives indicated that their occupation was homemaker or housewife, and about 10 percent did not report an occupation.

The most frequent occupation reported by wives was clerical-sales; professional and service worker occupations both ranked

second (Table 6). Wives in the subsample are underrepresented in the professional and blue collar categories by 5 and 3 percent respectively in comparison to the AESP sample. The single parent families ineligible for the subsample account for most of the shift in occupational distribution for wives.

Because of the frequency with which wives are employed parttime, data were classified as parttime and fulltime employment. However, fulltime employment occurred 2.5 times as frequently as parttime employment (Table 7).

Comparison of Chosen and Rejected Subsample Families

Since the potential for bias could exist in the findings as the result of ineligibility of 19 percent of the husband-wife families in the AESP sample, a number of contextual variables were compared for the chosen subsample and the rejected subsample families. These comparisons provided information on a set of measurable demographic variables that assisted in defining limits for generalizing the findings. Supportive data are given in a series of tables in Appendix A.

In general, the subsample is comparable in demographic variance to the AESP sample. However, there are some distributional shifts due to missing data and/or collaboration criteria which eliminated 38 husband-wife families. The majority of rejected families were two-member families in the latter stages of the family life cycle with high school or less education. Although husbands in

both the rejected and accepted subsample were most frequently in blue collar occupations, husbands in the rejected subsample were overrepresented in the managerial occupation category and under-represented in the professional category.

The rejected and accepted subsamples were similar in income and wives' employment status variance. The accepted subsample was found to be representative of the urban-rural ratio (3:1) in the AESP sample.

About 25 percent of the rejected families had missing data on the eco-consciousness scale. Since bias in the findings could exist if this nonresponse represented a covert response to issues surrounding the energy problem, measures of attitudes and action regarding the energy situation were analyzed.

Belief in the reality of the energy problem and actions taken in response to the energy problem were similar in the rejected and accepted subsamples (Table 8 and 9). Over 85 percent of the respondents reported attempting to conserve energy in both sub-samples. Most families did not respond with an unqualified "yes" to the reality of the energy problem. However, wives in the accepted subsample deviated from other respondents in their more frequent belief in the energy problem. Also, wives in the accepted subsample were more likely to have persuaded others to conserve energy than other groups of respondents. In general, the accepted subsample families are not dissimilar from the rejected families on attitude and action regarding the energy situation.

TABLE 8.--Classification of Accepted and Rejected Subsample Married
Families by Belief in Reality of the Energy Problem.

Is Energy Problem Real?	Accepted Families		Rejected Families	
	Husbands N=157	Wives N=157	Husbands N=38	Wives N=38
Yes	42.7	57.3	44.7	44.7
No, but there might be in the near future	21.0	21.7	10.5	21.1
No, but there might be in the distant future	14.6	11.5	15.8	13.2
Yes, but it will be solved by ending Arab Embargo	1.9	1.3	2.6	0.
No	19.7	8.3	23.7	15.8
No Response	0.	0.	2.6	5.3
	100.0%	100.0%	100.0%	100.0%

TABLE 9.--Classification of Accepted and Rejected Subsample Married
Families by Actions Taken in Response to the Energy
Problem.

Action in Response to the Energy Problem[a]	Accepted Families		Rejected Families	
	Husbands N=157	Wives N=157	Husbands N=38	Wives N=38
Done little or nothing	10.8	7.6	10.5	7.9
Read, studied	50.3	49.7	42.0	44.7
Talked to others about it	52.9	62.4	47.4	50.0
Tried to conserve energy	87.3	90.4	86.8	89.5
Tried to persuade others to conserve energy	22.9	31.8	23.7	18.4
Taken political action	2.5	3.2	5.3	0.
No response	0.	0.	0.	2.6

[a]Columns not cumulative due to possible multiple responses
by each respondent.

Development of Measures

The research model included values, energy conservation practices, and contextual variables. Individual husband and wife measures were transformed into family scores for energy conservation practices and a family typology for each of the four values-- self-esteem, familism, social responsiveness, and eco-consciousness.

The inherent properties of the two variables, values and practices, suggested different procedures for forming family scores. Values are psychological constructs, concepts of the desirable, and not directly observable. Energy conservation practices are overt activities, have physical properties, and can be directly observed. The family score for practices is basically a percentage of practices adopted based on the husband and wife responses.

Nine types of family value configurations were conceptualized based on the husband-wife degree of congruency and commitment for each value. For example, husband and wife may both hold the value of eco-consciousness with high, medium, or low commitment; the husband may hold the value with high commitment and the wife with low commitment and thus have an incongruent value commitment. Each of the values was studied independently rather than combined into a composite of the four values. The nominal scale properties of value patterns and sample size prevented the latter approach.

Discussion which follows will center on describing each of the measures and the scoring procedures. The energy conservation measure is a dependent or criterion variable in the parametric models

and therefore the measures of central tendency and dispersion will be discussed in relation to the assumptions of the statistical models. Each of the four value scales will be described and the reliability coefficient reported for the aggregate of husbands and wives separately. The coefficient reported for reliability represents a measure of internal consistency, i.e., unity of scale items (Mehrens and Lehmann, 1973). Since the procedure for developing the nine types of intrafamilial value configurations was the same for each of the values, family value scores will follow scale descriptions.

Contextual variables will be briefly described. Each of the scales and coding rules for all variables is displayed in Appendix B.

Measure: Energy Conservation Practices

A scale of 14 practices was used to measure the rate of adoption of energy conservation practices within the household over the past year. The measure included practices which met the following criteria: practices widely promoted for the one-year period prior to the survey and during the survey to minimize the possibility of families being unfamiliar with it; appropriate for families without major capital outlay; and, independent so adoption of one practice would not necessitate the adoption of other practices. Respondents were directed to indicate if the practice was implemented more during the winter of 1973-74 than the previous season, the same

as the previous season, or if the practice was not physically possible in their home.

A family energy conservation index was developed to represent the increase of practices families adopted within the past year. One point was given for each practice adopted on the 14-item scale and the sum divided by the total possible; a percentage score was the statistic. For example, if the husband and wife indicated it was "not physically possible" to close the fireplace damper nor control water heater temperatures, and had adopted six of the remaining 12 practices during 1973-74, their score was 50 percent.

The response of family respondents was not the same for all scale items. It is assumed that lack of intrafamilial agreement occurred because the spouses were not equally informed about practices adopted and/or they used a personal rather than a family frame of reference for their response. Rules for arriving at a family score were developed for cases in which the husband and wife gave different answers. They were:

Rule 1: If one spouse indicated "this season more than last season," the scale item was coded as a practice adopted.

Rule 2: If one spouse indicated "not physically possible" and the other spouse recorded "this season the same as last season," additional information from the AESP data bank was used to validate the answer.

The frequency of adoption for each practice in families (Table 10) is based on the use of Rule 1. In about 85 percent of the families, spouses differed in reporting practice adoption. For

TABLE 10.--Energy Conservation Practices Adopted by Families.

Energy Conservation Practice	Families Percent N=157
Turn off lights not . . . in use	83
Maintain daytime . . . 68°	80
Turn down thermostat . . . night	76
Wear heavier clothing at home	76
Turn down thermostat . . . vacation	74
Close off . . . unused areas of home	61
Close drapes . . . night	55
Open drapes . . . sunny days	54
Replace bulbs . . . lower wattage	54
Use only warm-cold cycles . . . washing	44
Change furnace air filter . . .	43
Have heating equipment checked . . .	28
Turn down temperature . . . water heater	26
Close fireplace damper . . .	15

example, the husband may have reported that the heating equipment was checked and the wife indicated that warm-cold wash cycle was an adopted practice. The frequency with which Rule 1 was used in coding family scores suggested that sex role differences were reflected in this measure.

The most frequently adopted practices by families were turning off unused lights, adjusting the thermostat to use less energy, and wearing heavier clothing. About 4 out of 5 families reported that they maintain daytime temperatures of 68° or less and turned off all lights not actually in use. The low adoption rate of

furnace maintenance, water temperature efficiency, and fireplace adjustments reflects the presence of dwellings where these practices were "not physically possible" in the sample. So these families were not penalized, the family practice score was calculated with the number of practices physically possible as the denominator.

The determination of "not physically possible" required the use of Rule 2. Most frequently the husband and wife did not agree on the physical possibility of closing doors and turning off heat to unused areas of the house, having heating equipment adjusted for efficiency by a serviceman, and turning down temperature control of hot water heater. There were 66 occurrences of Rule 2 and it affected 44 family scores (Appendix B, Table B-1, page 118).

To implement Rule 2, additional family data were used to validate the physical possiblity of the practice being adopted. Most frequently data on the existence of a thermostat, ownership of a water heater and washing machine, and type of furnace if family did not live in an apartment-type dwelling were used to code the family response. The lack of agreement on closing off unused areas of the home was perceived too subjective to be determined by data on number of rooms and size of family. Therefore, in the ten families where this disagreement occurred, the practice was coded "not physically possible."

The analysis strategies used to test the association of independent variables with energy conservation practices, the dependent variable, assumed some level of normality. Multiple

regression, analysis of variance, and multiple classification analysis (the statistical models used) are based on the assumption that the sample has been drawn from a population that is normally distributed. However, most research reported on the effects of sample nonnormality and heterogeneity of variance conclude that these parametric measures are robust, i.e., the ordinary t and F tests are nearly immune to violation of these assumptions (Boneau, 1971; Lindquist, 1953; Glass and Stanley, 1970). Lindquist stated:

. . . unless the heterogeneity of either form or variance is so extreme as to be readily apparent upon inspection of the data, the effect upon the F distribution will probably be negligible (p. 86).

TABLE 11.--Descriptive Statistics for Energy Conservation Scale.

Descriptive Statistic	Families N=157
Measure of central tendency	
Mean	60.8
Median	63.9
Measures of dispersion	
Variance	839.3
Standard Deviation	28.9
Standard Error	2.3
Kurtosis	-.8
Skewness	-.4
Measure of reliability	
Alpha coefficient	.85

The descriptive statistics for the distribution of the conservation adoption scores (Table 11) indicate that the scores deviated slightly from normality. The mean and median would both be 50 with a symmetric distribution; greater numbers of families have a higher adoption rate than would be expected from the population. The negative skewness, -.4, revealed a distribution with more values clustered to the right and some extreme values to the left. A flatter than normal distribution is indicated by the negative kurtosis.

The effects of nonnormality in this sample of scores were viewed as within the tolerable limits of parametric statistics, with some minor reservations. The probability of a type one error, i.e., the null hypothesis is rejected when in fact it should not be rejected, may be increased. According to Lindquist (1971):

> . . . the F-distribution is practically unaffected by lack of symmetry, per se, in the distributions of criterion measures, but is slightly affected if the distribution of criterion measures is roughly symmetrical but either very flat or very peaked. In the latter cases, the probabilities read from the normal-theory F-table are too small to represent the true risk of a Type I error, and due allowances should be made for this in the interpretation of results. In such cases, . . . when the "apparent" risk (as read from the F-table) of a Type I error is 5%, the true risk may be as large as 8%, and when the apparent level of significance of an F-test is the 1% level, the actual level of significance may be the 2% level (approximately) (p. 351).

In summary, the reported tests of association and differences using parametric models, will be discussed with the probability of Type I error due to distribution nonnormality included.

Reliability was established for the subsample on the practice adoption scale. The reliability coefficient, .85, represents a measure of high internal consistency for the scale (Table 11).

Measure: Self-Esteem Value

The self-esteem test was developed by Rosenberg (1965) to measure attitudes toward the self along a favorable to unfavorable dimension. It consisted of ten statements on a Likert-type summated rating scale (Appendix B). Robinson and Shaver (1973:98-110) documented construct validity and reliability for the scale.

Self-esteem is defined as the respect that a person has for self and included recognition of self-limitation and growth potential. This value is the conception of self as an overall judgment of worth as a person.

Reliability was established for the subsample. The reliability coefficients, .74 for husbands and .79 for wives, represent a measure of internal consistency for the scale.

Measures of central tendency included: 3.19, 3.18 means for husbands, wives; 3.09 median for both husbands and wives. In a test of differences between the mean of husbands and wives, they were found not to be significantly different.

Measure: Familism Value

The measure of familism value was originally developed by van der Veen, et al., (1964; 1974) to measure the real and the ideal concepts of family as perceived by family members. The AESP adapted

the measure to be used as a self-administered test by selecting 20 of the 80 items based on item discrimination scores reported by Imig (1971). The scale, Family Concept Inventory, was also converted from a Q-sort to a Likert-type scale so it could be self-administered with a large sample.

The value of familism is defined as the perception that a family member has of his/her family unit and the level of integration of its membership. For this study, one item was omitted from the 20-item scale in an effort to maintain independence of value scales. The item, "we get along very well in the community," was inconsistent with the conceptual definition of familism and over-lapped with the social responsiveness value. The scale items used to measure familism are listed in Appendix B.

The alpha coefficients for reliability were calculated for the 19-item scale used to measure familism. The coefficients, .89 for wives and .86 for husbands, were the highest of any of the scales.

The means were similar for husbands and wives and in a test of difference, the husband and wife scores did not differ significantly. (Mean 3.74 for husbands, 3.80 for wives; median 3.79 for husbands, 3.89 for wives.)

Measure: Social Responsiveness
Value

Social responsiveness value is defined as the conception of the interdependence of person-society, the degree of integration of

family members into larger social structure. The eight-item measure is listed in Appendix B.

This measure included the five-item anomia scale developed by Srole (1965) and three items from a test of internal versus external control by Rotter (1966). The anomia scale was developed to measure integration of the individual into society. Robinson and Shaver (1973:173) reported the Likert-type scales met the criteria of unidimensionality. Since only three of the 23 forced choice pairs of items developed by Rotter were used to measure societal connectedness, statements of support for validity from the widely used index are inappropriate.

The social responsiveness scale was analyzed to determine reliability for the subsample. The alpha coefficients which measure the unidimensionality of the scale, were .79 for husbands and .77 for wives.

In a test of the difference between two dependent means, the husbands' and wives' scores were not found to be significantly different. Means were 3.01, 3.07 for husbands and wives and medians 2.88, 3.13 for husbands and wives, respectively.

Measure: Eco-Consciousness
Value

The eco-consciousness measure was adapted from two Likert-type scales used as indices of a conceptualization of ecological linkages to the energy situation. The value of eco-consciousness is defined as the perception of the interrelationship of man-nature.

The scale items used to measure the value were selected from scales in the larger study to measure this unitary concept (Appendix B). Several scales were constructed and the scale item correlations examined. The final eight-item measure reflects an overall alpha correlation of .75 for husbands and .81 for wives.

The mean and median scores for husbands and wives were similar: 3.62 mean and median for husbands; 3.77 mean and 3.87 median for wives. In a test of difference between the means of the two groups, no significant difference was found due to sex role.

Typology of Intrafamilial Value Patterns

Family value patterns were conceptualized based on the intrafamilial patterns of congruency and commitment. The basic procedure for developing the family typology was the same for each of the four values and was developed in three steps. First, an average score was calculated for each respondent from the raw score items.

Second, the distribution of means for the aggregate of husbands and wives was calculated separately to test for sex role bias in each of the value scales. This test of two dependent means was a prerequisite to determining the procedure for partitioning the scores into high, medium, and low commitment categories. If the test had indicated that the distribution of the means was significantly different for wives and husbands, the partitioning would have been done separately for husbands and wives scores. As reported in

the description of each value scale, there was no significant dif-

ferences between scale means.

TABLE 12.--Distribution of Value Scores Above, Around, and Below
the Mean by Husbands and Wives.

Classification of Scale	Scores to be Included	Husbands Percent	Wives Percent
Self-esteem			
Above mean	3.33 - 4.00	31	32
Around mean	3.50 - 3.88	26	22
Below mean	2.20 - 3.00	43	46
		100%	100%
Familism			
Above mean	3.95 - 4.84	34	38
Around mean	3.77 - 3.95	28	26
Below mean	2.20 - 3.78	38	36
		100%	100%
Social Responsiveness			
Above mean	3.38 - 4.50	38	34
Around mean	2.75 - 3.25	26	25
Below mean	1.38 - 2.74	36	41
		100%	100%
Eco-consciousness			
Above mean	3.87 - 5.00	36	34
Around mean	3.50 - 3.86	22	23
Below mean	1.50 - 3.49	42	43
		100%	100%

The last step in developing the family typology was classi-

fication of husband-wife scores into one of nine intrafamilial types

based on the partitioned distribution (Table 12). Approximately

one-fourth of the scores around the mean comprised the "medium commitment" classification. Scores higher than this group were defined as "high commitment" and scores lower than around the mean were termed "low commitment." The family typology was as follows:

1. Husband-wife have high commitment to the value.

2. Husband has high commitment and wife medium commitment.

3. Wife has high commitment and husband medium commitment.

4. Husband-wife have medium commitment.

5. Wife has high commitment and husband low commitment.

6. Husband has high commitment and wife low commitment.

7. Wife has medium commitment and husband low commitment.

8. Husband has medium commitment and wife low commitment.

9. Husband-wife have low commitment.

Three of the patterns reflect high levels of value congruency between husband and wife: husband-wife above the mean, around the mean, and below the mean (patterns 1, 4, and 9 respectively). About half of the 157 families were classified in one of these congruent patterns for familism, eco-consciousness, and social responsiveness (Table 13). Only 39 percent of the couples held a congruent self-esteem value.

The maximum incongruency between husband and wife on a given value is categorized in patterns 5 and 6, husband below the mean and wife above the mean and visa versa. Most frequently this incongruency was found in the self-esteem value, about 22 percent;

TABLE 13.--Classification and Frequency of Family Value Patterns of Values--Self-esteem, Familism, Eco-consciousness, and Social Responsiveness.

Family Patterns[a]	Self-Esteem	Familism	Eco-Consciousness	Social Responsibility
	Number	Number	Number	Number
1. Husband, wife above mean	19	30	36	35
2. Husband above, wife around mean	13	14	16	12
3. Wife above, husband around mean	14	16	16	10
4. Husband, wife around mean	7	16	13	15
5. Wife above, husband below mean	17	13	15	9
6. Husband above, wife below mean	17	9	14	11
7. Wife around, husband below mean	11	11	8	12
8. Husband around, wife below mean	23	12	7	17
9. Husband, wife below mean	36	36	32	36
TOTAL	157	157	157	157

[a] Cell factor level in analysis of variance statistical model.

eco-consciousness, familism, and social responsibility had declining proportions of families, 18, 14, and 13 percent respectively.

The highest commitment to a given value is categorized in pattern 1, husband and wife above the mean, and the lowest commitment in pattern 9, husband and wife below the mean. Families tabulated as patterns 2 and 3 reflect a higher commitment than families who were pattern 7 and 8.

While there is some hierarchial order to the patterns, the typology is a nominal measurement, i.e., all the numbers assigned to the patterns cannot be ordered or added. For example, there is no conceptual basis for weighing pattern 5 over pattern 6 or visa versa. Statistical tests to determine significance among different patterns in relation to energy conservation practices and contextual variables were conducted using analysis of variance and multiple classification analysis. The nine types of families with respect to direction and congruency of values were cell factor levels in the analysis of variance model.

Measures: Contextual Variables

The contextual variables included in the study were: education, occupation, and age of husband; education, employment status, and age of wife; and family income, size, stage of family life cycle, and urban-rural residency. The distribution of these variables was discussed in describing the sample. The measures are standardized indices; the coding for contextual variables is listed in Appendix B.

Occupation of husbands was recoded from census categories
into prestige scores. The research methodology employed for the
prestige scores was implemented and reported by Siegel (1975) and
is an update of the 1963 North-Hatt-NORC study. The National
Opinion Research Center, University of Chicago, sponsored the studies
to measure the social status associated with occupations.

Since occupation of wives was reported earlier in this
chapter as an ambiguous concept, employment status was operational-
ized as an alternative variable. A dichotomous employment status
variable, employed or not employed, divided the sample in equal
proportions.

Research Hypotheses

The data analysis will be reported around general research
questions because of the large number of variables tested in this
exploratory study. Differences among the types of intrafamilial
value patterns in the adoption of household energy conservation
practices were specifically hypothesized and other linkages were
stated in general hypothesizes.

General Research Question I: Is there a difference among the
intrafamilial value patterns in adoption of energy conserva-
tion practices?

Ho 1: There is a difference among the nine intrafamilial
value patterns of self-esteem in adoption of energy
conservation practices.

Ho 2: There is a difference among the nine intrafamilial
value patterns of familism in adoption of energy
conservation practices.

Ho 3: There is a difference among the nine intrafamilial value patterns of social responsiveness in adoption of energy conservation practices.

Ho 4: There is a difference among the nine intrafamilial value patterns of eco-consciousness in adoption of energy conservation practices.

General Research Question II: Is there a relationship between adoption of energy conservation practices and contextual variables?

Ho 5: Adoption of energy conservation practices vary with contextual variables--occupation, education, and age of husband; employment status, education, and age of wife; family size, income, stage of family life cycle, and urban-rural residence.

General Research Question III: Is there a difference among the intrafamilial value patterns with respect to contextual variables?

Ho 6: There is a difference among the nine intrafamilial value patterns of self-esteem, familism, social responsiveness, and eco-consciousness with respect to contextual variables--occupation, education, and age of husband; employment status, education, and age of wife; family size, income, and stage of family life cycle.

Data Analysis Procedures

Parametric and nonparametric statistical models were used in hypotheses testing. An alpha level of .05 was used in two-tailed tests to determine the probability of a Type I error, i.e., the null hypothesis is rejected and in fact it is true.

The statistics (t,F) used to generate alpha levels of significance were not the sole criteria for evaluating the hypotheses. Rather, the test of significance and coefficients of correlation both assisted in determining the degree to which the relationships were meaningful propositions (Rozeboom, 1971).

Statistical Models

The parametric models that were used to test the hypotheses included analysis of variance and covariance, multiple classification analysis, and multiple regression. The underlying assumptions of the parametric models, normality and continuous variables, were reviewed first. The assumption of normality evaluated in describing the measures of dispersion for household energy conservation practices was of primary concern. It was concluded that the effects of nonnormality were within the tolerable limits of parametric statistics.

One-way analysis of variance was used to test the differences among intrafamilial value patterns in adoption of energy conservation practices and with respect to contextual variables (hypotheses 1 to 4 and 6). Each family value typology was an independent variable, i.e., factor with nine cells, a nonorthogonal design due to unequal cell frequencies.

Post hoc tests were implemented on contrasts developed from a priori contrasts to investigate which intrafamilial value patterns contributed to the tested difference in adoption of energy conservation practices. This technique was implemented only if a significant overall difference among intrafamilial patterns was determined with the criterion variables in an analysis of variance test (Glass and Stanley, 1970).

Analysis of covariance was used to test the differences in practice adoption rate among intrafamilial value patterns while

controlling for the effect of contextual variables. Covariates,
the contextual variables, were selected to remove extraneous varia-
tion from the criterion variable, energy conservation practices.

Multiple classification analysis (MCA) is a statistical
technique for examining the relationship between independent varia-
bles, with no better than nominal measurement, and an intervally
scaled dependent variables (Andrews, et. al., 1973). MCA, a multi-
variate technique, calculated the coefficients of the relationship
between the patterns of family values and adoption of energy con-
servation practices before and after adjusting for the effects of
covariates. This parametric model is designed to handle nominal
level independent variables, correlated independent variables, and
nonlinear relationships. Tests of significance (F,t) generated in
the analysis of variance procedures were used to determine the
probability of the relationships.

Multiple regression, a statistical technique by which the
linear dependence of one variable on others is summarized and
decomposed so relationships in the population can be evaluated,
was used to predict the adoption of energy conservation practices
from contextual variables. Since interval measurement is required
for multivariate regression, family values and stages of the family
life cycle variables were not included. Forward stepwise regression
was used to order the contextual variables to provide the best
prediction equation to predict energy conservation practices.

Lambda and uncertainty coefficient, nonparametric statistics,
were used to measure the relationship between stages of the family

life cycle and each family value pattern. Both of the variables were nominal in scale; statistics were calculated from crosstabulations. Lambda measures the percentage of improvement in predicting the dependent variable based on the modal value of the independent variable (Babbie, 1973). The uncertainty coefficient is similar to lamdba, except that the uncertainty coefficient considers the entire distribution, not just the mode (Nie, et al., 1975). The uncertainty coefficient is the proportion by which "uncertainty" in the dependent variable is reduced by knowledge of the distribution of the independent variable. The concept of uncertainty is related to the ambiguity of data distributions and was developed from literature on information theory.

Chi-square, a nonparametric test of statistical significance, could not be used to determine whether a systematic relationship existed between family values and stages of family life cycle because the sample was not sufficiently large to meet the cell frequency requirements. The six by nine design would require a sample of 270 to meet the minimal 5 per cell requirement. Collapsing categories in levels of variables to achieve a five by six design was considered inappropriate due to information loss and problems of interpreting the results.

Computer Programs

The Control Data Corporation 6500 model computer was used to perform all of the analyses. The programs to compute the statistics were available through the 6.0 version of the Statistical Package

for Social Sciences (Nie, et al., 1970). All of the computations

were implemented at the Michigan State University Computer Labora-

tory.

CHAPTER IV

RESULTS OF DATA ANALYSIS

Results of the data analyses are reported in relation to six

hypotheses and are presented under the following section headings:

(1) family values and energy conservation practices, (2) contextual

variables and energy conservation practices, (3) family values and

contextual variables, and (4) summary.

Family Values and Energy Conservation Practices

Each of the values were entered separately as factors* in a

one-way analysis of variance with adoption of energy conservation

practices as the criterion variable. The first three hypotheses will

be discussed as a group because of similar test outcome.

Ho 1: There is a difference among the nine intrafamilial
value patterns of self-esteem in adoption of energy
conservation practices.

Ho 2: There is a difference among the nine intrafamilial
value patterns of familism in adoption of energy
conservation practices.

Ho 3: There is a difference among the nine intrafamilial
value patterns of social responsiveness in adoption
of energy conservation practices.

The magnitude of the F-statistic suggested that there was no

difference among the intrafamilial patterns of self-esteem,

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*The nine cell factor levels are described on page 60.

familism and social responsiveness in the adoption of energy conservation practices (Table 14). Thus, Ho 1, Ho 2, and Ho 3 were rejected.

TABLE 14.--Summary of One-Way ANOVA Tests for Differences in Adoption of Energy Conservation Practices by Family Values--Self-esteem, Familism, Social Responsiveness, and Eco-consciousness.

Family Value	One-Way ANOVA Tests[a]		
	Between Group Mean Squares	Within Group Mean Squares	F-Statistic (Probability)
Self-esteem	.1222	.0817	1.496 (.163)
Familism	.0538	.0854	.630 (.752)
Social responsiveness	.0490	.0856	.573 (.799)
Eco-consciousness	.1886	.0781	2.415 (.018)[b]

[a]8 and 148 df
[b]Significant level: $p < .05$.

Ho 4: There is a difference among the nine intrafamilial value patterns of eco-consciousness in adoption of energy conservation practices.

There was support for the hypothesized difference (Table 14). An examination of means and standard deviations of energy conservation practices by pattern of eco-consciousness in families revealed that families with high commitment to eco-consciousness adopted 72 percent of the practices in comparison to 46 percent by families with low commitment to the value (Table 15).

TABLE 15.--Means and Standard Deviaions of Energy Conservation
Scores Based on Eco-consciousness Family Value Patterns.

Family Typology[a]	N	Mean	Std. Dev.
1. Husband, wife above mean	36	.72	.21
2. Husband above, wife around mean	16	.56	.24
3. Wife above, husband around mean	16	.53	.35
4. Husband, wife around mean	13	.56	.27
5. Wife above, husband below mean	15	.69	.25
6. Husband above, wife below mean	14	.65	.25
7. Wife around, husband below mean	8	.63	.35
8. Husband around, wife below mean	7	.74	.30
9. Husband, wife below mean	32	.46	.31
TOTAL (Grand Mean)	157	(.61)	

[a]Cell factor levels in analysis of variance statistical model.

TABLE 16.--Post Hoc Comparisons of A Priori Contrasts of Eco-
Consciousness Family Value Patterns in Adoption of
Energy Conservation Practices.

Contrast[a]	Pooled Variance[b] T-Statistic (Probability)	Separate Variance	
		T-Statistic (Probability)	df
Family type 1 and 9	3.710 (.000)[c]	3.800 (.000)[c]	54.0
Family type 1 and 4	1.744 (.083)	1.860 (.079)	17.6
Family type 4 and 9	1.025 (.307)	.994 (.330)	25.2
Family type 1 and 5/6	.655 (.514)	.771 (.446)	34.7
Family type 1/4 and 5/6	-.478 (.633)	-.519 (.606)	44.0

[a]Family types classified in Table 15.

[b]148 df

[c]Significant level: $p < .05$.

The location of the differences between means was calculated using post hoc tests (Table 16). Families with high and low commitment to eco-consciousness value had significantly different adoption of energy conservation practices (contrast: family type 1 and 9). The t-statistic was in the area of rejection for contrasts involving congruency differences (contrasts: family type 1 and 5/6; family type 1/4 and 5/6).

Analysis of covariance was computed with husband's occupation, wife's education, and husband's education as covariates. The covariates were selected because of their supported variance with family eco-consciousness. However, husband's education as a covariate was dropped because it was in the area of rejection in the analysis of covariance test (F-statistic .713; p > .99). With husband's occupation and wife's education as covariates, the differences among the nine intrafamilial value patterns of eco-consciousness in adoption of energy conservation practices was supported (Table 17).

Multiple classification analysis was computed to determine the magnitude of the relationship between eco-consciousness and practices, with and without the covariates (Table 18). In general, there were small differences in the adoption of energy conservation practices due to the confounding effects of wife's education and husband's occupation. The combined effects of family eco-consciousness, wife's education, and husband's occupation increased prediction of practices by about 4 percent. Approximately 11.5

TABLE 17.--Analysis of Covariance Test of Differences in Adoption of
Energy Conservation Practices Among Intrafamilial
Patterns of Eco-Consciousness with Control Variables.

Source of Variation	Mean Squares	df	F-Statistic (Probability)
Covariates	.221		2.925 (.05)[a]
Husband's occupation	.336	1	4.452 (.03)[a]
Wife's education	.306	1	4.053 (.04)[a]
Main effects	.200	8	2.653 (.01)[a]
Residual	.075	146	
TOTAL	.084	156	

[a]Significant level: p < .05.

TABLE 18.--Multiple Classification Analysis of Relationship Between
Eco-consciousness Value and Energy Conservation Practices
with Covariates: Wife's Education and Husband's Occupa-
tion.

Eco-consciousness Value Family Typology	N	Deviation from Grand Mean[a]	
		Unadjusted	Adjusted for Covariates
1. Husband, wife above mean	36	.11	.13
2. Husband above, wife around mean	16	-.05	-.05
3. Wife above, husband around mean	16	-.07	-.06
4. Husband, wife around mean	13	-.05	-.06
5. Wife above, husband below mean	15	.09	.06
6. Husband above, wife below mean	14	.04	.05
7. Wife around, husband below mean	8	.02	.00
8. Husband around, wife below mean	7	.14	.17
9. Husband, wife below mean	32	-.14	-.15
TOTAL	157		
Multiple R		.340	.396
Multiple R^2		.115	.156

[a]Grand mean - .61 (61 percent of practices adopted).

percent of the variation in adoption of energy conservation practices can be predicted by family eco-consciousness value. Thus, Ho 4 is accepted.

Contextual Variables and Energy Conservation Practices

The relationship between eight of the nine contextual variables and adoption of energy conservation practices was investigated simultaneously using a step-wise multiple regression model. Differences in practices among the stages of the family life cycle were tested using analysis of variance.

> Ho 5: Adoption of energy conservation practices vary with contextual variables--occupation, education, and age of wife; family size, income, stage of family life cycle, and urban-rural residence.

The eight contextual variables were entered into the regression equation to predict adoption of energy conservation practices (Table 19). Wife's education was the only variable that met the F-test of significance criterion and since it predicted less than 1 percent of the variance in energy conservation practices, wife's education was not a meaningful predictor. The contextual variables were not meaningful predictors.

The stage of the family life cycle was entered in a one-way analysis of variance model as a factor and adoption of energy conservation practices as the criterion variable. No support was noted for differences among the stages of the cycle, in adoption of energy conservation practices. Thus, Ho 5 was rejected.

TABLE 19.--Multiple Regression Analysis Predicting Adoption of
Energy Conservation Practices From Contextual Variables.

Contextual Variable	Correlation Coefficient[a]	Stepwise Regression	
		F-Statistic (Probability)	Additive R^2
Wife's education	.09	4.906 (.03)[b]	.008
Husband's occupation	-.10	2.562 (.11)	.026
Wife's employment status	-.08	1.150 (.28)	.010
Husband's education	-.03	.458 (.50)	.004
Family income	-.07	.701 (.40)	.004
Family size	.01	.449 (.50)	.003
Urban-rural residence	.04	.198 (.66)	.001
Wife's age	.02	.525 (.81)	.001
Husband's age	.03	.244 (.88)	.000

Multiple R - .238 R^2 - .157   F-Statistic - .978
df - 9 and 147   Probability - .460

[a].159 required for .05 significance level.

[b]Significant level: p < .05.

TABLE 20.--One-Way ANOVA Test for Differences Among the Stages of
Family Life Cycle Relationship in Adoption of Energy
Conservation Practices.

Source of Variation	Degrees Freedom	Mean Squares	F-Statistic (Probability)
Between groups	5	.0568	.671 (.646)
Within groups	151	.0846	
TOTAL	156		

Family Values and Contextual Variables

A difference between intrafamilial value patterns and contextual variables was posed in a general hypothesis.

Ho 6: There is a difference among the nine intrafamilial value patterns of self-esteem, familism, social responsiveness, and eco-consciousness with respect to contextual variables--occupation, education, and age of husband; employment status, education, and age of wife; family size, income, and stage of family life cycle.

TABLE 21.--Summary of ANOVA and MCA Tests for Differences Among Intrafamilial Patterns of Social Responsiveness Value in Respect to Contextual Variables.

Contextual Variable	One-Way ANOVA Tests[a]		MCA Tests[b]
	F-Statistic (Probability)		Eta
Husband's education	4.476	(.001)[c]	.44
Wife's education	3.429	(.001)[c]	.40
Family income	2.320	(.023)[c]	.33
Husband's occupation	1.789	(.083)	.30
Family size	1.501	(.161)	.27
Wife's age	1.244	(.277)	.25
Husband's age	1.210	(.296)	.25
Wife's employment	.628	(.999)	.18

[a]Degrees of freedom 8 and 148 in Analysis of Variance Test.

[b]Eta statistic equivalent to multiple R in Multiple Classification Analysis Test.

[c]Significant level: p < .05.

A series of one-way analysis of variance tests was performed with all possible combinations of contextual variables and each family value. The contextual variables were entered into the model as criterion variables and the intrafamilial value patterns were factor level cells. Relationship coefficients, eta, were calculated by entering each of the 32 combinations of variables in multiple classification analysis procedure.

Social responsiveness family value patterns with respect to husband's education, wife's education, and family income had significant F-ratios (Table 21). The strength of the relationship was greatest for education of the husband and the wife with social responsiveness family value, .44 and .40 eta coefficients respectively (Table 21). Family income had a significant but less meaningful variance with the value.

Means and standard deviations of husband's education, wife's education, and family income among the family patterns of social responsiveness were examined for a priori contrasts (Table 22). Post hoc comparison tests were conducted in respect to the three contextual variables (Table 23). Couples with congruent high commitment to social responsiveness were more highly educated and had higher incomes than couples with congruent low commitment to the value (contrast: family type 1 and 9). There was additional support that level of education is related to high value commitment in contrast to families with low commitment and incongruency (wife's education contrast--family type 1 and 8/9; husband's education contrasts--

TABLE 22.--Means and Standard Deviations of Wife's Education, Husband's Education, and Family Income Based by Social Responsiveness Intrafamilial Value Patterns.

Social Responsiveness Value Family Typology[a]	N	Wife's Education		Husband's Education		Family Income	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
1. Husband, wife above mean	35	13.9	(2.4)	15.6	(3.3)	13.7	(6.2)
2. Husband above, wife around mean	12	12.7	(2.3)	13.2	(2.1)	13.7	(4.7)
3. Wife above, husband around mean	10	12.6	(2.8)	13.4	(2.8)	14.9	(3.7)
4. Husband, wife around mean	15	12.6	(2.0)	13.3	(2.5)	13.3	(4.9)
5. Wife above, husband below mean	9	13.3	(2.6)	13.9	(1.7)	10.3	(4.8)
6. Husband above, wife below mean	11	13.1	(1.6)	13.8	(2.7)	15.7	(2.8)
7. Wife around, husband below mean	12	13.5	(2.3)	13.3	(3.2)	14.9	(4.1)
8. Husband around, wife below mean	17	11.2	(2.5)	11.4	(4.2)	10.3	(5.4)
9. Husband, wife below mean	36	11.7	(1.9)	11.8	(2.8)	11.2	(5.2)
TOTAL (Grand Mean)	157	(12.7)		(13.3)		(12.8)	

[a]Cell factor levels in analysis of variance statistical model.

TABLE 23.--A Priori Contrasts of Wife's Education, Husband's Educa-
          tion, and Family Income Based on Family Value of Social
          Responsiveness.

Contextual Variable and Contrasts[a]	Pooled Variance		Separate Variance	
	t-Statistic (Probability)	df	t-Statistic (Probability)	df
Wife's education				
Family type 1 and 9	4.178 (.000)[b]	148	4.300 (.000)[b]	63.3
Family type 1 and 8/9	4.856 (.000)[b]	148	4.568 (.000)[b]	42.8
Family type 1 and 5/6	1.071 (.286)	148	1.037 (.314)	16.9
Husband's education				
Family type 1 and 9	5.234 (.000)[b]	148	5.145 (.000)[b]	66.8
Family type 1 and 5/6	2.049 (.042)[b]	148	2.325 (.028)[b]	27.7
Family type 1 and 5/7	2.361 (.020)[b]	148	2.555 (.017)[b]	27.0
Family income				
Family type 1 and 9	2.033 (.044)[b]	148	1.814 (.074)	66.1
Family type 1 and 5/6	.457 (.649)	148	.474 (.614)	21.0

[a]Family types classified in Table 22.

[b]Significant level: p < .05.

family type 1 and 5/6, family type 1 and 5/7). There was insuffi-
cient support for linkage of family income to value congruency
(contrast: family type 1 and 5/6).

Eco-consciousness family value patterns with respect to
wife's education and husband's education and occupation had signifi-
cant F-ratios (Table 24). Husband's education and occupation had a
significant but less meaningful variance with eco-consciousness than
wife's education.

The differences among family patterns of eco-consciousness
and the three significant contextual variables were further examined

TABLE 24.--Summary of ANOVA and MCA Tests for Differences Among
Intrafamilial Patterns of Eco-consciousness Value in
Respect to Contextual Variables.

| Contextual Variable | One-Way ANOVA Tests[a] | MCA Tests[b] |
	F-Statistic (Probability)	Eta
Wife's education	5.343 (.001)[c]	.47
Husband's education	3.342 (.002)[c]	.39
Husband's occupation	2.868 (.006)[c]	.37
Husband's age	1.560 (.141)	.28
Wife's employment	1.361 (.218)	.26
Wife's age	1.344 (.226)	.26
Family income	.906 (.999)	.22
Family size	.275 (.999)	.12

[a]8 and 148 df in Analysis of Variance Test.

[b]Eta equivalent to multiple R statistic in Multiple Classification Analysis Test.

[c]Significant level: p < .05.

by comparing the distribution of means (Table 25). Post hoc comparison tests were conducted in respect to wife's education and husband's education and occupation (Table 26). The tests were supportive of both direction and congruency contrasts for the three contextual variables. Higher levels of education for both husbands and wives and occupational prestige for the husbands were associated with high commitment to eco-consciousness (contrast: family type 1 and 9). And there was support for the contrast between highly congruent and committed husband-wife eco-consciousness and

TABLE 25.--Means and Standard Deviations of Husband's Occupation, Husband's Education, and Wife's Education Based on Family Value of Eco-consciousness.

Eco-Consciousness Value Family Typology[a]		Husband's Occupation		Husband's Education		Wife's Education	
		Mean	(S.D.)	Mean	(S.D.)	Mean	(S.D.)
1. Husband, wife above mean	36	50.0	(18.8)	15.2	(3.3)	14.5	(2.6)
2. Husband above, wife around mean	16	40.9	(17.1)	13.4	(3.3)	13.1	(1.8)
3. Wife above, husband around mean	16	45.2	(15.6)	14.0	(4.2)	12.6	(1.9)
4. Husband, wife around mean	13	36.6	(7.5)	12.4	(2.3)	12.1	(1.7)
5. Wife above, husband below mean	15	35.9	(17.7)	13.6	(1.6)	12.7	(1.6)
6. Husband above, wife below mean	14	40.4	(12.5)	13.2	(2.1)	12.0	(2.5)
7. Wife around, husband below mean	8	34.2	(8.0)	11.7	(2.8)	11.9	(1.5)
8. Husband around, wife below mean	7	46.6	(19.0)	13.6	(4.7)	11.4	(3.6)
9. Husband, wife below mean	32	35.5	(12.0)	11.6	(3.0)	11.5	(1.8)
TOTAL (Grand Mean)	157	(41.4)		(13.3)		(12.7)	

[a]Cell factor levels in analysis of variance statistical model.

TABLE 26.--Post Hoc Comparisons of Differences Among Family Patterns of Eco-consciousness Value in Respect to Wife's Education and Husband's Education and Occupation.

Contextual Variables and Contrasts[a]	Pooled Variance[b] t-Statistic (Probability)	Separate Variance t-Statistic (Probability)	df
Wife's Education			
Family type 1 and 9	5.815 (.000)	5.671 (.000)	62.6
Family type 1 and 6/8	4.552 (.000)	3.170 (.010)	10.4
Family type 1 and 5/6	4.046 (.000)	3.705 (.001)	35.1
Husband's Education			
Family type 1 and 9	4.730 (.000)	4.643 (.000)	66.0
Family type 1 and 4	2.765 (.006)	3.321 (.002)	31.7
Family type 1 and 5/6	2.267 (.025)	2.676 (.010)	51.4
Husband's Occupation			
Family type 1 and 9	3.890 (.000)	3.821 (.000)	60.2
Family type 1 and 5/7	3.547 (.001)	3.610 (.000)	34.7
Family type 1 and 5/6	3.109 (.002)	2.809 (.008)	40.2

[a]Family types are classified in Table 25.

[b]148 df, p < .05.

incongruent value commitment (contrast: family type 1 and 5/6) with the three contextual variables.

There was insufficient support to accept a systematic relationship among the intrafamilial value patterns of self-esteem and familism with respect to contextual variables based on one-way analysis of variance tests (Appendix C).

Lambda and uncertainty coefficients were calculated to determine the relationship between the intrafamilial value patterns and the six stages of the family life cycle. Knowing the stage of the family life cycle would improve prediction of familism and

TABLE 27.--Summary of Lambda and Uncertainty Coefficient Tests of Relationship between Stages of Family Life Cycle and Intrafamilial Patterns of Values.

Family Value	Lambda	Uncertainty Coefficient
Familism	.09	.10
Social Responsiveness	.09	.08
Self-esteem	.03	.07
Eco-consciousness	.03	.06

social responsiveness value patterns by about 9 percent (Table 27). The sample size did not permit significance testing to determine probability of error; the predictive nonparametric statistics are reported only tentatively.

In review of Ho 6, there was variance in family income and husband and wife's education among the intrafamilial differences in social responsiveness. In addition, husband and wife's education and husband's occupation were related to differences in eco-consciousness. Thus, Ho 6 is partially supported.

Summary

The results of the analyses are summarized in Table 28. A difference was found among the nine intrafamilial value patterns of eco-consciousness in adoption of energy conservation practices. There was a significant difference among the nine intrafamilial value patterns of eco-consciousness in wife's education, husband's education and his occupation; and among the patterns of social

TABLE 28.--Summary of Findings by Hypothesis with Significance Level and Correlation Coefficient.

Focus of Hypothesis[a]	HO[b]	p[c]	Eta (R)	Lambda	Supported
Energy conservation related to:					
self-esteem	1	.16	.27		
familism	2	.75	.18		
social responsivensss	3	.80	.17		
eco-consciousness	4	.02	.34		x
Energy conservation related to:					
husband's education	5	.50	(.22)		
wife's education	5	.03	(.09)		
husband's occupation	5	.11	(.18)		
wife's employment	5	.28	(.21)		
family income	5	.40	(.23)		
family size	5	.50	(.23)		
husband's age	5	.88	(.24)		
wife's age	5	.81	(.24)		
urban-rural residence	5	.66	(.24)		
family life cycle	5	.65	.18		
Eco-consciousness value related to:					
wife's education	6	.00	.47		x
husband's education	6	.00	.39		x
husband's occupation	6	.01	.37		x
family income	6	.99	.22		
family size	6	.99	.12		
husband's age	6	.14	.28		
wife's age	6	.23	.26		
wife's employment	6	.22	.26		
stage of family life cycle	6	--		.03	

TABLE 28.--Continued.

Focus of Hypothesis[a]	HO[b]	p[c]	Eta (R)	Lambda	Supported
Social responsiveness value to:					
husband's education	6	.00	.44		x
wife's education	6	.00	.40		x
family income	6	.02	.33		x
husband's occupation	6	.08	.30		
family size	6	.16	.27		
husband's age	6	.30	.25		
wife's age	6	.28	.25		
wife's employment	6	.99	.18		
stage of family life cycle	6	.--		.09	
Self-esteem value related to:					
husband's education	6	.06	.30		
wife's education	6	.07	.30		
husband's occupation	6	.26	.25		
wife's employment	6	.99	.20		
husband's age	6	.99	.22		
wife's age	6	.99	.20		
family size	6	.13	.28		
family income	6	.24	.26		
stage of family life cycle	6	--		.03	
Familism value related to:					
husband's occupation	6	.99	.19		
wife's employment status	6	.99	.21		
family size	6	.99	.20		
husband's age	6	.35	.24		
wife's age	6	.38	.23		
family income	6	.33	.24		
wife's education	6	.99	.14		
husband's education	6	.38	.23		
stage of family life cycle	6	--		.09	

[a]Hypothesis stated on page 63-64. [b]Hypothesis number [c]Sig. level

responsiveness in wife's education, husband's education, and family income.

There was no difference among the family value patterns of self-esteem or familism in energy conservation practices or contextual variables. And, there was no meaningful relationship between adoption of practices and contextual variables.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS

The study will be summarized and findings discussed in rela-
tion to related research studies and theory. Implications of the
findings will be related to research and educational programs.
Headings in the chapter include: overview of the study, discussion
of the findings, limitations of the study, and implications for
research and educational programs.

Overview of the Study

Energy conservation was viewed as desirable family managerial
behavior in an era where finite resources are assessed to be incap-
able of meeting high consumption levels on a sustained basis. The
family, a principal social unit in which values are internalized
and patterns of energy consumption are learned, was the unit of
analysis. The primary focus of the research was to determine if
there were differences in the adoption of household energy conserva-
tion practices among families with varying husband-wife patterns of
congruency and commitment to values. This exploration included an
investigation of the interaction effects of family member's value
congruency, i.e., synergetic behavior of families.

The values included in the study were: self-esteem,
familism, social responsiveness, and eco-consciousness. Contextual

variables were also studied in respect to practices and intrafamilial values. The sets of relationships among the variables with the greatest magnitude were used in building a conceptual model of family management using an ecosystem perspective.

Data collected in the Michigan Agricultural Experiment Station Project 3152, "Functioning of a Family Ecosystem in a World of Changing Energy Availability," were used to study the differences in husband-wife value patterns with respect to the adoption of energy conservation practices and contextual variables. A subsample of 157 families was selected from the larger multistage probability sample of the Lansing Standard Metropolitan Statistical Area.

Behavioral scales from the larger study were adapted to measure the values of eco-consciousness, social responsiveness, and familism. The value of self-esteem was measured using the Rosenberg (1965) scale. Nine types of value configurations were conceptualized based on the husband-wife degree of congruency and commitment. The typology of husband-wife patterns was developed to measure the synergetic properties of family interaction. Each of the values was studied separately rather than combined into a composite scale of values because of sample size restrictions.

A scale of 14 practices was used to measure the adoption rate of household energy conservation. The family score for practices was basically a percentage of practices adopted based on husband and wife responses. The contextual variables included occupation, education, age, family income, size of family, urban-rural residence, and stage in family life cycle.

Reliability was established for each of the value scales and the energy conservation scale. The coefficients, which ranged from .74 to .89, were a measure of internal consistency of the scales. Both parametric and nonparametric statistical models were used to test the hypothesized relationships and differences among variables.

Discussion of Findings

Discussion of the results of data analysis is organized around three research questions.

Research Question 1: Is there a difference in adoption of household energy practices among the nine intrafamilial patterns of values--eco-consciousness, self-esteem, familism, and social responsiveness?

(The results of the analyses indicated that the value of eco-consciousness is a meaningful predictor of energy conservation behavior. In families where the husband and wife had a high commitment to eco-consciousness, they were high adopters of energy conservation practices; low husband-wife commitment resulted in low adoption of conservation practices.)

While values have been postulated to be a directive element in family management (Gross, Crandall, and Knoll, 1973; Deacon and Firebaugh, 1975), there is little empirical support for this generalization. The Kimball (1960) study offered some support in terms of congruency of husband-wife hierarchy of 12 values. He reported that very low managerial practice adoption was associated with dissimilar value hierarchies. As similarity of values increased,

up to a point, the total adoption of practices increased. While the
present research used a monopolar value scale, i.e., ranged from
no commitment to high commitment on each value, in general the
results empirically support a relationship between values and
practices.

(The finding of no differences in adoption of conservation
practices among the husband-wife value patterns for self-esteem,
familism, and social responsiveness is difficult to discuss rela-
tive to prior research. The content of values measured has varied
from study to study and furthermore, few studies have tested the
relationship of values to practices. The terminal nature of the
values of self-esteem, familism, and social responsiveness versus
the instrumental properties of eco-consciousness may have contributed
to the differential findings in this study. Rokeach (1974) defined
ideal states of existence as terminal and ideal modes of behavior
as instrumental properties of values. Hence, instrumental properties
of eco-consciousness may lead to energy conservation behavior while
terminal values give more generalized preference to behavior.

The terminal-instrumental dichotomy may be a helpful dis-
tinction for classifying values significantly related to managerial
situations. For example, while familism may have terminal properties
in household energy conservation decisions, familism may have
instrumental properties in marriage, divorce, childbearing, and
other life style decision situations. Only the question of rela-
tionship between values and energy conservation behavior is reported
in this research.

Rescher (1969b) and Williams (1970) theorized that value

change is linked to the finiteness of resources. While the dynamics

of value change was not measured in the present study, the strength

of the relationship between valuing eco-consciousness and adopting

energy conservation practices may be dependent on the explicit

"scarcity of energy resources" component in the measure of eco-

consciousness. Hence, change in managerial practices may be more

closely related to instrumental values than terminal values and to

those values which are being rescaled because of competing demands

for scarce resources.

Research Question 2: Is there a relationship between adoption
    of household energy conservation practices and contextual
    variables?

Finding no significant relationship between adoption of

household energy conservation practices and contextual variables is

contrary to some research findings. It should be noted that wife's

education was weakly linked to practice adoption. It predicted

less than 1 percent of the variance in practices and thus, was not

a meaningful contextual variable.

Warren (1975) and Kilkeary and Thompson (1975) reported

family income to be positively related to adoption of energy conserva-

tion practices. Therefore, it was expected that the higher the

income, the greater would be the adoption of household energy prac-

tices in this study. This was not the case.

One problem in comparing the findings is the difference in

measure of conservation practices. While the Warren and Kilkeary-

Thompson studies included practices related to the use of the car,

this study excluded conservation of gasoline practices. Warren suggested government intervention into private decisions regarding gasoline availability during the winter of 1973-74 distinguised conservation of gasoline from conservation of energy for maintenance of the household. Furthermore, Newman and Wachtel (1974) found that gasoline had a stronger positive relationship with income than natural gas. Thus, studies which included conservation of gasoline in the measure of practices for the time period under study might postulate a stronger relationship between conservation practices and income than studies which excluded gasoline.

Rogers and Shoemaker (1971) reported research which supported the relationship between education, social status, and adoption of practices. Education and husband's occupational prestige, indices of socio-economic status, were not supported in respect to energy conservation practice adoption. Age was not an important predictor of practice adoption in the Rogers-Shoemaker research review. This concurs with findings in this study. Rate of household energy conservation practice adoption was not found to be related to education, occupation, or age of the married couple, family size, income, urban-rural residence, or stage of the family life cycle.

Research Question 3: Is there a difference among the intra-familial value patterns of familism, social responsiveness, eco-consciousness, and self-esteem with respect to contextual variables?

The focus on differences among the husband-wife patterns of values in relation to contextual variables was established to explore the values explicit in family management from an ecosystem

perspective (Steidl, 1969; Hook and Paolucci, 1970). Familism and social responsiveness values were conceptualized to measure the interdependence of human beings in their decisions involving resources. Eco-consciousness value represented the interrelationship of man and the physical environment. Self-esteem value had been suggested as an antecedent and/or parallel value to social integrative and adaptive values (Gross, Crandall, and Knoll, 1973:118-119).

The social responsiveness value was found to be related to family income, husband's education and wife's education. Hence, the magnitude of the family income and education levels was predictive of high commitment to the social responsiveness value. From the nature of the scale used to measure this value, low levels of social responsiveness were equated with social alienation (Srole, 1956). Is it possible that money and formal education are prerequisites for realization of a social responsiveness value commitment? Or with higher levels of education is there opportunity to increase one's social map and hence learn to become more socially responsive?

There was a positive relationship between education of husband and wife with eco-consciousness. In addition, husband's occupational prestige was significantly related to eco-consciousness. Hence, the higher the wife's education level, the husband's education and his occupational level, the greater the commitment to eco-consciousness value. It may be that the access to primary data on the finite stock of resources is greater for families with higher

education and in families with husbands in professional and mana-
gerial occupations. Thus, there may be more opportunity for
families with higher quality of information to rescale their value
commitment and adopt new practices of energy conservation.

The values of self-esteem and familism were not signifi-
cantly related to contextual variables. Families with highly con-
gruent and incongruent value patterns occurred across stages of the
family life cycle, age ranges, levels of income, education, occupa-
tional prestige, and employment status of the wife. Thus, we have
no recognizable pattern of information about the variance to predict
the effects of congruency levels in families regarding self-esteem
and familism.

In summary, there was support for research questions 1 and
3. It was found that husband-wife commitment to eco-consciousness
value was the strongest predictor of household energy conservation
behavior. There was no systematic relationship between adoption of
practices and contextual variables. The values of social respon-
siveness and eco-consciousness were related to selected contextual
variables. Husband's education, wife's education, and family income
have a positive relationship with social responsiveness; husband's
education, his occupational prestige level, and wife's education
are associated with high commitment to an eco-consciousness value.

In the broadest sense, a partial family management model
has been empirically supported, i.e., an interdependence of value
and practice (Figure 2). The model suggests that eco-consciousness
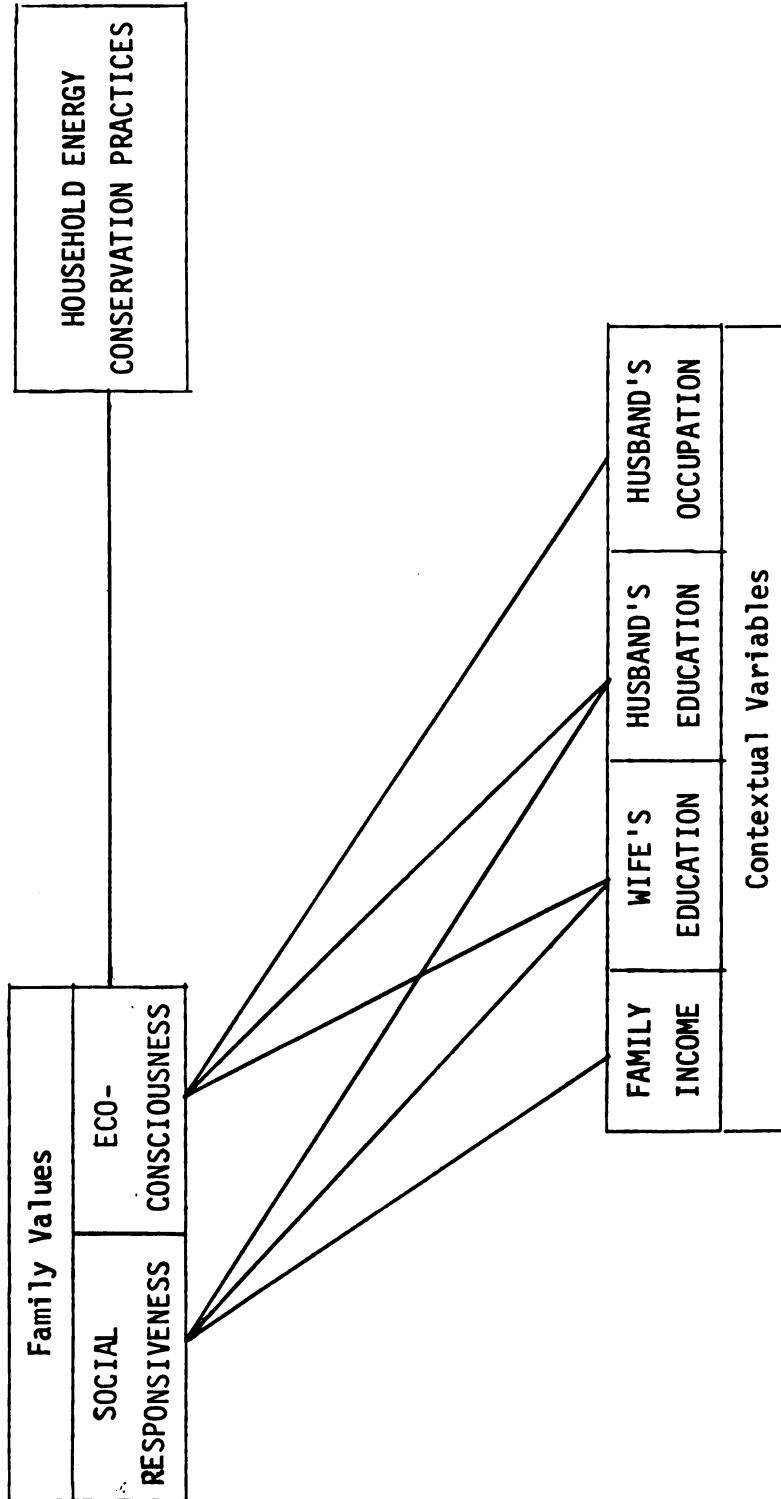
Figure 2.--Model of Empirically Supported Relationships: Family Values and Household Energy Conservation Practices, Family Values and Contextual Variables.

and energy conservation practices are organized in relation to each other and that this relationship accounts for some of the family's managerial behavior. In addition, there is a reported interdependence between commitment to eco-consciousness and wife's education, husband's education, and his occupation. It should be noted that there was a slight improvement in the prediction of practice adoption when there was knowledge of wife's education and husband's occupation in addition to commitment to an eco-consciousness value. This was not the case for other contextual variables.

While the outcome variable in the model was not related to social responsiveness, there was found to be strength in the linkages between the value and contextual variables--family income, wife's education and husband's education. There was no significant relationship found between contextual variables and practices.

Although the model is incomplete, it is postulated that a holistic model can be built with empirical support found in partial models. This study can make a contribution to a family management model.

Limitations of the Study

1. The subsample used in the study underrepresented families in the latter stage of the family life cycle. Therefore, generalizations pertaining to older couples' values commitment and adoption of practices are limited. Single parent families were excluded.

2. The subsample size did not permit significance testing for the differences between the six stages of the family life cycle

and the nine types of husband-wife value patterns. Therefore, support was not postulated between these variables.

Implications of the Study

The suggestions for further research and implications for educational programs will be discussed in this section.

Research

Further development of the measure of conservation practices regarding direct energy use would assist in building a more comprehensive model of family management. The scaling dimension of the present measure might be converted into a degree of intensity measure to improve the discrimination among adoption levels. For example, is the thermostat turned down to 68° in the daytime always, sometimes, or never? Also, subscales on conservation of gasoline in the family automobile(s), electricity in the use of major appliances, and energy for household heating and cooling could be developed to test the relationships among the socio-economic status variables and each of the types of energy intensive activities. Other researchers have reported differences among income groups in the magnitude of discretionary energy consumed. The degree to which families conserve energy may be related to energy choices other than those measured in this study.

The exploration of changes in indirect energy consumption patterns in relation to an eco-consciousness value commitment would be another area for research. Do families perceive the relationship

between their consumption choices and energy used for production, transportation, and distribution of food, appliances, and other goods? How are the values of thrift and eco-consciousness related to adoption of indirect energy consumption patterns?

Further research into family value congruencies could include one-parent families and husband-wife-children families as respondents. The size of the sample to examine these intrafamilial value patterns in survey research would need to be much larger than the current study and/or the pattern typology would need to be partitioned into fewer congruency-commitment categories. Congruency of value systems and outcome behavior among different types of families and with additional family respondents would expand the model of family management to be more representative of the population.

The effect of congruency in values needs to be further studied in terms of outcome behavior. Because there was limited support in this research to link levels of congruency with educational levels, and no support that congruency levels were related to rate of practice adoption, this area of family interaction remains to be explored further. Would it be helpful to know which family members controlled the thermostat and which family members made decisions about the temperature of the water for the laundry? Would composite values give greater insight into consensus-dissensus patterns in the family than monopolar value scales? The size of the sample required for combining monopolar values into composite value patterns as developed in this research would be sufficiently large that alternative measures should be considered.

Educational Programs

Based on the finding that eco-consciousness value has a positive relationship to the adoption of energy conservation practices and that eco-consciousness is linked to husband and wife's education, programs aimed at conservation of energy resources will be more effective if the transactional properties of eco-consciousness are examined. The finite supply of renewable resources and the capacity of the earth to assimilate wastes can be discussed in relation to the demand brought about by alternative consumption patterns. The costs and benefits of high and low commitment to eco-consciousness could be estimated and technical energy information included which would bring values to the level of consciousness and motivate changes in behavior. Education is recommended to bring about increased energy conservation behavior and minimize the need for external regulations mandating life style changes in families.

APPENDICES

APPENDIX A

ACCEPTED AND REJECTED SUBSAMPLE FAMILIES

OPERATIONAL DEFINITIONS

<u>Accepted Subsample</u>: Meets the sample criteria for the study: presence of a husband and wife respondent in the family, completeness of data on value orientation and managerial practice variables and independence of respondent response on value orientation variables. Included are 157 families.

<u>Rejected Subsample</u>: Does not meet the criteria for completeness of data and/or independence of respondent response on value orientation variables. Included are 38 families.

TABLE A-1.--Classification of Accepted and Rejected Subsample
Families by Stage of Family Life Cycle.

Stage of Family Life Cycle	Accepted Families	Rejected Families
Couple, wife under 40 years, no children	12.7	7.9
Couple, oldest child six years or less	22.3	5.3
Couple, oldest child seven to 12 years	19.7	5.3
Couple, oldest child 13 to 19 years	22.3	13.2
Couple, oldest child 20 years and over	10.2	26.3
Couple, wife over 40 years, no children	12.7	42.1
TOTAL	100.0%	100.0%
Number	157	38

TABLE A-2.--Classification of Accepted and Rejected Subsample
Families by Size of Household.

Number in Household	Accepted Families	Rejected Families
2	24.2	50.0
3	21.0	15.8
4	28.7	15.8
5	13.4	7.9
6	6.4	2.6
7 or more	6.3	7.9
TOTAL	100.0%	100.0%
Number	157	38

TABLE A-3.--Classification of Accepted and Rejected Subsample
Families by Role and Age.

Age Categories	Accepted Families		Rejected Families	
	Husbands	Wives	Husbands	Wives
Under 18	0	0	0	0
18-29 years	35.0	40.8	13.2	13.2
30-44 years	37.6	35.7	13.2	21.1
45-64 years	24.8	21.7	52.6	50.0
65 years and over	2.5	1.9	21.1	15.8
TOTAL	100.0%	100.0%	100.0%	100.0%
Number	157	157	38	38

TABLE A-4.--Classification of Accepted and Rejected Subsample
Families by Educational Attainment.

Years of School Completed	Accepted Families		Rejected Families	
	Husbands	Wives	Husbands	Wives
0-11 years, less than high school	17.4	16.6	44.7	34.2
12 years, high school completed	33.8	47.1	23.7	31.6
1-3 years college or vocational school	21.3	18.5	10.5	15.8
4 years or more college professional training	27.1	17.8	18.4	15.8
No response	0	0	2.6	2.6
TOTAL	100.0%	100.0%	100.0%	100.0%
Number	157	157	38	38

TABLE A-5.--Classification of Accepted and Rejected Subsample
Families 1973 Income.

Gross Family Income Categories	Accepted Families	Rejected Families
Less than $4,999	8.3	5.3
$5,000 to $9,999	15.9	21.1
$10,000 to $14,999	32.8	31.6
$15,000 to $24,999	28.7	26.3
$25,000 or more	14.6	10.5
No response	0.0	5.3
TOTAL	100.0%	100.0%
Median Income	$13,400	$12,600
Number	157	38

TABLE A-6.--Occupational Classification of Accepted and Rejected
Subsample Families as Defined by Husbands and Wives.

Occupation Category	Accepted Families		Rejected Families	
	Husbands	Wives	Husbands	Wives
Professional	22.3	11.5	7.9	15.8
Managerial	7.6	4.5	21.1	5.3
Clerical-sales	12.1	33.8	10.5	26.3
Blue collar	51.6	8.9	55.3	7.9
Service worker, private household worker	3.8	11.5	5.3	5.3
Subtotal	97.4	70.2	100.0	60.6
Homemaker	0	20.4	0	28.9
No response	2.5	9.4	0	10.5
TOTAL	100.0%	100.0%	100.0%	100.0%
Number	157	157	38	38

TABLE A-7.--Employment Status of Wives in Accepted and Rejected
Subsample Families.

Employment Category	Accepted Families	Rejected Families
Fulltime, 35 hours minimum	36.3	34.2
Parttime, 34 hours or less	14.0	10.5
Not employed	49.7	52.6
	100.0%	100.0%

TABLE A-8.--Classification of Accepted and Rejected Subsample
Families by Geographic Location.

Geographic Location	Accepted Families Percent	Rejected Families Percent
Urban	74.5	60.5
Rural	25.5	39.5
TOTAL	100.0%	100.0%
Number	157	38

APPENDIX B

SCALES AND CODING RULES

Scale: Family Energy Conservation Practices.

Below is a second list of things families might do to reduce fuel bills and conserve energy. (Please check (√) only the things that apply to your dwelling place and your particular situation.

	This season more than last season	This season the same as last season	Not physically possible in our home
1. Turn down your thermostat at night.	_____	_____	_____
2. Maintain daytime temperatures at 68 degrees or less (especially if everyone is gone during the day).	_____	_____	_____
3. Turn down your thermostat when away for the weekend or on vacation.	_____	_____	_____
4. Close doors and turn off heat to unused areas of home.	_____	_____	_____
5. Change furnace air filter frequently to maintain efficiency (at least once a month).	_____	_____	_____
6. Have heating equipment checked, cleaned, and adjusted for top efficiency by a qualified serviceman.	_____	_____	_____

Scale: Family Energy Conservation Practice (Continued).

	This season more than last season	This season the same as last season	Not physically possible in our home
7. Close fireplace damper when not in use.	_____	_____	_____
8. Close drapes and/or pull shades at night.	_____	_____	_____
9. Open shades and drapes on sunny days.	_____	_____	_____
10. Wear heavier clothing at home.	_____	_____	_____
11. Turn off all lights not actually in use.	_____	_____	_____
12. Replace some lights with bulbs of lower wattage.	_____	_____	_____
13. Turn down temperature control of hot water heater.	_____	_____	_____
14. Use only warm or cold cycles for clothes washing.	_____	_____	_____

Scale: Self-esteem

We would now like you to indicate how strongly you agree or disagree with the following statements. (Please check (✓) one on each line of the following statements.)

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. I feel that I'm a person of worth, at least equal to others.				
2. I feel that I have a number of good qualities.				
3. All in all, I am a failure.				
4. I am able to do things as well as most people.				
5. I feel I do not have much to be proud of.				
6. I take a positive attitude toward myself.				
7. On the whole, I am satisfied with myself.				
8. I wish I could have more respect for myself.				
9. I certainly feel useless at times.				
10. At times, I think I am no good.				

Scale: Familism

Please answer the following statements as they relate to your family. Please check (√) the blank which best fits your feelings for each of the following 19 questions.

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
1. Little problems often become big ones for us.					
2. We are a strong competent family.					
3. Accomplishing what we want to do seems to be difficult.					
4. There are many conflicts in our family.					
5. Each of us wants to tell the other what to do.					
6. We often praise or compliment each other.					
7. We encourage each other to develop in his or her own individual way.					
8. Usually each of us goes his own separate way.					
9. We tend to worry about many things.					
10. We sometimes wish we could be an entirely different family.					
11. We respect each other's privacy.					

Scale: Familism (Continued).

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
12. We do not understand each other.	___	___	___	___	___
13. Our decisions are not our own, but are forced on us by others.	___	___	___	___	___
14. There are serious differences in our standards and values.	___	___	___	___	___
15. We do not like each other's friends.	___	___	___	___	___
16. The family has always been very important to us.	___	___	___	___	___
17. We resent each others outside activities.	___	___	___	___	___
18. We are a disorganized family.	___	___	___	___	___
19. We do many things together.	___	___	___	___	___

Scale: Eco-consciousness

To what extent does each of the following contribute to the energy problem? (Check (✓) one answer on each line).

	Very Great Extent	Great Extent	Some Extent	Slight Extent	No Extent At All
1. Scarcity of energy resources	___	___	___	___	___
2. Waste	___	___	___	___	___
3. Over-population	___	___	___	___	___
4. Scarcity of adequate energy supplies	___	___	___	___	___
5. Bad planning	___	___	___	___	___
6. Over-consumption	___	___	___	___	___

Below is a list of questions about energy (gasoline, natural gas, electricity). Please check (✓) one on each line for each statement.)

	Strongly Agree	Agree	No Opinion	Disagree	Strongly Disagree
7. If everybody tried to conserve energy, it would really make a difference.	___	___	___	___	___
8. Our basic natural resources are in short supply, the sooner we face up to this and change our way of life the better off the country will be.	___	___	___	___	___

Scale: Social Responsiveness

Below are some statements regarding public issues. How much do _you_ agree with each of the following? (Please check (✓) _one_ space for each of the 5 questions below according to your feelings.)

	Strongly Agree	Agree	Uncertain	Disagree	Strongly Disagree
1. There's little use in writing to public officials because they often are not really interested in the problems of the average man.					
2. Nowadays a person has to live pretty much for today and let tomorrow take care of itself.					
3. In spite of what some people say, the lot of the average man is getting worse not better.					
4. It is hardly fair to bring children into the world with the way things look for the future.					
5. These days a person does not really know whom he can count on.					

Scale: Social Responsiveness (Continued).

Below are some statements about public and private concerns. Please check (√) one answer that you agree with more for each of the following pairs of statements. There is no right answer, just check (√) either a or b, according to how you feel.

6. a. _____ The average citizen can have an influence in government decisions.

   b. _____ This world is run by the few people in power, and there is not much the little guy can do about it.

7. a. _____ As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.

   b. _____ By taking an active part in political and social affairs, the people can control world events.

8. a. _____ With enough effort we can wipe out political corruption.

   b. _____ It is difficult for people to have much control over the things politicians do in office.

RULES FOR MISSING DATA ON
VALUE SCALES

Self-Esteem and Eco Consciousness Scales: If more than one item was omitted on either the husband's or wife's scale, family was rejected from the subsample; if one item was blank on either the husband's or wife's scale, the respondent's mean score for the scale was coded as the response.

Social Responsiveness Scale: If any item was omitted on either the husband's or wife's scale, the family was rejected from the subsample.

Familism Scale: If more than two items were omitted on either the husband's or wife's scale, the family was rejected from the subsample; if one or two items were blank on either the husband's or wife's scale, the respondent's mean score for the scale was coded as the response.

Alternative Rule for Scales: If a respondent recorded two responses for one scale item, did not record a response for an adjacent item and answered a similar item(s) in another part of the instrument: response consistency was assumed and missing data recoded according to the researcher's judgment of the respondent's intended response. There were ten cases included in the subsample using this rule.

Coding: Value Scales

A. Self-esteem scale

    4-strongly agree   items: 1, 2, 4, 6, and 7
    3-agree
    2-disagree
    1-strongly disagree

    4-strongly disagree   items: 3, 5, 8, 9, and 10
    3-disagree
    2-agree
    1-strongly agree

B. Familism

    5-strongly agree   items: 2, 6, 7, 11, 17, and 20
    4-agree
    3-no opinion
    2-disagree
    1-strongly disagree

    5-strongly disagree   items: 1, 3-5, 8-10, 12, 13, 15,
    4-disagree   16, 18, and 19
    3-no opinion
    2-agree
    1-strongly agree

C. Eco-consciousness

    5-very great extent   items: 1-6
    4-great extent
    3-some extent
    2-slight extent
    1-no extent at all

    5-strongly agree   items: 7 and 8
    4-agree
    3-no opinion
    2-disagree
    1-strongly disagree

D. Social responsiveness

    5-strongly disagree   items: 1-5
    4-disagree
    3-uncertain
    2-agree
    1-strongly agree

    4-(a)   items: 6 and 8
    2-(b)

    4-(b)   item: 7
    2-(a)

TABLE B-1.--Use of Rule 2* in Family Energy Conservation Practice
Scores.

Energy Conservation Practice	Use of Rule 2 Number
1. turn down thermo . . . night	6
2. maintain 68° daytime . . .	5
3. turn thermo . . . when away	2
4. close doors . . . unused areas	10
5. cge furnace air filter . . .	7
6. heating equip checked . . .	9
7. close fireplace damper . . .	0
8. close drapes . . . shades . . .	4
9. open drapes . . . shades . . .	1
10. wear heavier clothing . . .	0
11. turn off lights not using . . .	0
12. replace lower wattage light . . .	2
13. turn down temp water heater . . .	17
14. use only warm or cold cycle . . .	6
TOTAL	66
Number of Families	44

*If one spouse indicated "not physically possible" and
the other spouse recorded "this season the same as last season,"
additional information from the AESP data bank was used to validate
the answer.

Coding: Contextual Variables

Age (year of birth)

Education

00-kindergarden or none
01-11 grades completed
12-high school graduate
13-special schooling: barber,
   business school etc.
14-A.A., R.N.
16-B.S., B.A.
18-M.A., M.A., R.N. with B.S.
21-Ph.D., M.D., etc.

Occupation

The 3-digit classification of
1970 Census of Population was
recoded into 2-digit prestige
scores adopted by National Opinion
Research Center (Siegel, 1975)

Income (gross family income)

00-no response
01-under $2,000
02-$2,000-$2,999
03-$3,000-$3,999
04-$4,000-$4,999
05-$5,000-$5,999
06-$6,000-$6,999
07-$7,000-$7,999
08-$8,000-$8,999
09-$9,000-$9,999
10-$10,000-$10,999
11-$11,000-$11,999
12-$12,000-$12,999
13-$13,000-$13,999
14-$14,000-$14,999
15-$15,000-$15,999
16-$16,000-$17,999
17-$17,000-$20,999
18-$21,000=$24,999
19-$25,000-$29,999
20-$30,000-$49,999
21-$50,000 and above

Stage of family life cycle

Earliest to latest stage
coded 1-6; refer to Table 1
for classification

Size of Household/Family

Actual number used

Wife's employment

0-not employed
1-employed

Residence

1-rural
2-urban

APPENDIX C

SUPPLEMENTARY FINDINGS

TABLE C-1.--Summary of ANOVA and MCA Tests for Differences Among Intrafamilial Patterns of Self-Esteem Value in Respect to Contextual Variables.

Contextual Variable	One-Way ANOVA Tests[a]	MCA Tests[b]
	F-Statistic (Probability)	Eta
Husband's education	1.890 (.066)	.30
Wife's education	1.846 (.072)	.30
Family size	1.582 (.134)	.28
Family income	1.321 (.236)	.26
Husband's occupation	1.267 (.264)	.25
Husband's age	.961 (.999)	.22
Wife's employment	.768 (.999)	.20
Wife's age	.736 (.999)	.20

[a]8 and 148 df.   [b]Eta equivalent to multiple R statistic.

TABLE C-2.--Summary of ANOVA and MCA Tests for Differences Among Intrafamilial Patterns of Familism Value in Respect to Contextual Variables.

Contextual Variable	One-Way ANOVA Tests[a]	MCA Tests[b]
	F-Statistic (Probability)	Eta
Family income	1.162 (.326)	.24
Husband's age	1.117 (.355)	.24
Wife's age	1.081 (.379)	.23
Husband's education	1.073 (.385)	.23
Wife's employment	.853 (.999)	.21
Family size	.780 (.999)	.20
Husband's occupation	.670 (.999)	.19
Wife's education	.374 (.999)	.14

[a]8 and 148 df.   [b]Eta equivalent to multiple R statistic.

BIBLIOGRAPHY

BIBLIOGRAPHY

Andrews, F. M.; Morgan, James N.; Sonquist, J. A.; and Klem, L.
Multiple Classification Analysis. Ann Arbor: Institute
for Social Research, University of Michigan, 1973.

Babbie, E. R. Survey Research Methods. Belmont, California:
Wadsworth Publishing, 1973.

Bates, Frederick L., and Harvey, Clyde C. The Structure of Social
Systems. New York: Gardner Press, Inc., 1975.

Boneau, C. Alan. "The Effects of Violations of Assumptions Under-
lying the t Test." In Contemporary Problems in Statistics,
pp. 357-370. Edited by Bernhardt Lieberman. New York:
Oxford University Press, 1971.

Boulding, Kenneth E. "The Emerging Superculture." In Values and
the Future, pp. 336-350. Edited by Kurt Baier and Nicholas
Rescher. New York: Free Press, 1969.

Bredemeier, Harry C. "On the Complementarity of Partisan and
Objective Research." American Behavioral Scientist 17
(September-October 1973): 5-25.

Brim, Orville G., Jr.; Glass, David C.; Lanvin, David E., and
Goodman, Norman. Personality and Decision Processes:
Studies in the Social Psychology of Thinking. Stanford,
California: Stanford University Press, 1962.

Cottrell, Fred. Energy and Society. Westport, Conn.: Greenwood
Press, 1955.

Cutler, Virginia F. Personal and Family Values in the Choice of
a Home. Cornell University Agricultural Experiment Station
Bulletin 840. Ithaca, New York, November, 1947.

Deacon, Ruth, and Firebaugh, Francille M. Home Management: Context
and Concepts. Boston: Houghton-Mifflin, Inc., 1975.

Dyer, Doris M. "Students' Wives Values as Reflected in Personal
and Family Activities." Master's thesis, Michigan State
University, 1962.

123

Eichenberger, Mary Ann. "A Comparison of Ownership of Selected Household Appliances and Residential Energy Use by Employed and Nonemployed Homemakers in the Lansing, Michigan, Area." Master's thesis, Michigan State University, 1975.

Eigsti, Marilyn, H. "Interrelationships of Value Orientation, Decision-Making Mode and Decision-Implementing Style of Selected Low Socio-Economic Status Negro Homemakers." Ph.D. dissertation, Michigan State University, 1973.

Energy Policy Project of the Ford Foundation. A Time to Choose: America's Energy Future. Cambridge, Mass.: Ballinger Publishing Co., 1974.

Engebretson, Carol L. "Analysis of a Constructed Typology of Wives' Values Evident in Managerial Decision Situations." Ph.D. dissertation, Michigan State University, 1965.

Field, Anne E. "A Study of Water Consumption Practices in Households." Ph.D. dissertation, Michigan State University, 1973.

Fortenberry, Frances E. "Measurement of Values Relating to Kitchen Design." Master's thesis, Kansas State Universtiy, 1963.

Fritsch, Albert J., and Castlemen, Barry I. Lifestyle Index. Washington, D.C.: Center for Science in the Public Interest (1779 Church Street, N.W.), 1974.

Gladhart, Peter M. "The Energy Problem Continues: Impact and Implications for Urban and Industrial Centers." Remarks prepared for conference quoted by Michigan Farm Economics, 390 (July 1975): 3.

Glass, Gene V., and Stanley, Julian C. Statistical Methods in Education and Psychology. Englewood Cliffs, N. J.: Prentice Hall, Inc., 1970.

Granbois, Donald, and Willett, Ronald. "Equivalence of Family Role Measures Based on Husband and Wife Data." Journal of Marriage and Family 32 (February 1970): 68-72.

Gross, Irma. Proceedings of Conference on Values and Decision-making in Home Management. Michigan State University, East Lansing, Michigan, 1955.

Gross, Irma; Crandall, Elizabeth; and Knoll, Marjorie. Management for Modern Families. New York: Appleton-Century Crofts, 1973.
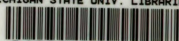
Grot, Richard A., and Socolow, Robert H. "Energy Utilization in a Residential Community." In Energy, pp. 483-498. Edited by Michael S. Macrakis. Cambridge, Mass.: MIT Press, 1974.

Handy, Rollo. The Measurement of Values. St. Louis, Mo.: Warren H. Green, Inc., 1970.

Hannon, Bruce. "Energy Conservation and the Consumer." Science 189 (July 11, 1975): 95-102.

Heberlein, Thomas A. "Conservation Information, The Energy Crisis, and Electricity Consumption in An Apartment Complex." Department of Rural Sociology, University of Wisconsin, 1974. (Mimeographed).

Hook, Nancy, and Paolucci, B. "Family as Ecosystem." Journal of Home Economics 62 (May 1970): 315-318.

Imig, David R. "Masculinity-Femininity as Related to Family-Marital Adjustment." Ph.D. dissertation, Michigan State University, 1971.

Jacob, Phillip E., and Flink, James J. with collaboration of Hedvah L. Shuchman. "Values and Their Function in Decision-Making." Supplement to American Behavioral Scientist 9 (May 1962): 7-34.

Kilkeary, Rovena, and Thompson, Patricia J. "The Energy Crisis and Decision-Making in the Family." New York: Herbert K. Lehman College, City University of New York, 1975. (Mimeographed.)

Kimball, William J. "The Relationship Between Personal Values and the Adoption of Recommended Farm and Home Practices." Ph.D. dissertation, University of Chicago, 1960.

Kluckhohn, Clyde, et al. "Values and Value-Orientations in the Theory of Action." In Toward a General Theory of Action. Edited by Talcott Parsons and Edward A. Shils. Cambridge: Harvard University Press, 1954.

Kluckhohn, Florence, and Stodtbeck, Fred L. Variations in Value Orientations. Evanston, Illinois: Row, Peterson and Co., 1961.

Koenig, Herman E., and Edens, Thomas C. "Energy, Ecology and Economics: The Realities of Thermo-dynamically Based Economies." Departments of Electrical Engineering and Systems Science and Agricultural Economics, Michigan State University, September 22, 1975. (Mimeographed.)

Lindquist, E. F. Design and Analysis of Experiments in Psychology and Education. Boston: Houghton Mifflin, 1953.

_____. "The Norton Study of the Effects of Non-normality and Heterogeneity of Variance." In Contemporary Problems in Statistics, pp. 348-356. Edited by Bernhardt Leiberman. New York: Oxford University Press, 1971.

Martin, Esther A. "Analysis by a Constructed Typology of Family Members' Values Evident in Managerial Decision Situations." Ph.D. dissertation, Michigan State University, 1965.

Meeks, Carol B., and Deacon, Ruth E. "Values and Planning in the Selection of a Family Living Environment." Journal of Home Economics 64 (January 1972): 11-16.

Mehrens, William A., and Lehmann, Irvin J. Measurement and Evaluation in Education and Psychology. New York: Holt, Rinehart, and Winston, 1973.

Morrison, Bonnie M. "Socio-Physical Factors Affecting Energy Consumption in Single Family Dwellings: An Empirical Test of a Human Ecosystems Model." Ph.D. dissertation, Michigan State University, 1975.

National Institute of Child Development and Human Development. The Acquisition and Development of Values. Report of a conference May 15-17, 1968. Washington, D.C.: U. S. Department of Health, Education, and Welfare, 1969.

Newman, Dorothy, and Wachtel, Dawn D. "The American Energy Consumer: Rich, Poor, and In-Between." In A Time to Choose, pp. 113-130. Cambridge, Mass.: Ballinger Publishing Co., 1974.

Nie, Norman H., et al. Statistical Package for the Social Sciences. New York: McGraw-Hill Book Company, 1975.

Nye, Ivan F. "Values, Family, and Changing Societies." Journal of Marriage and Family 27 (August 1967): 241-248.

Odum, Howard T. Environment, Power and Society. New York: John Wiley and Sons, Inc., 1971.

Paolucci, Beatrice. "Contributions of a Framework of Home Management to the Teaching of Family Relationships." Journal of Marriage and Family 28 (August 1966): 338-342.

Paolucci, Beatrice, and Hogan, M. Janice. "The Energy Crisis and the Family." Journal of Home Economics 65 (December 1973): 12-15.

Rescher, Nicholas. Introduction to Value Theory. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1969a.

_____. "What is a Value Change? A Framework for Research." In Values and the Future. Edited by Kurt Baier and N. Rescher. New York: Free Press, 1969b.

Robinson, J., and Shaver, P. Measures of Social Psychological Attitudes. Ann Arbor: University of Michigan, Institute for Social Research, 1973.

Rogers, Everett M., and Showmaker, F. Floyd. Communication of Innovations: A Cross-Cultural Approach. New York: Free Press, 1971.

Rokeach, Milton. "Change and Stability in American Value Systems, 1968-71." Public Opinion Quarterly 38 (Summer 1974): 222-238.

Rosenberg, M. Society and the Adolescent Self-Image. Princeton, N. J.: Princeton University Press, 1965.

Rotter, J. B. "Generalized Expectancies for Internal Versus External Control of Reinforcement." Psychological Monographs 80 (1966): 1-28.

Rozeboom, William W., "The Fallacy of the Null-Hypothesis Significance Test." In Contemporary Problems in Statistics, pp. 116-126. Edited by Bernhardt Lieberman. New York: Oxford University Press, 1971.

Safilios, R. C. "Family Sociology or Wives' Family Sociology? A Cross-Cultural Examination of Decision-Making." Journal of Marriage and Family 31 (May 1969): 290-301.

Schlater, Jean D. "The Management Process and Its Core Concepts." Journal of Home Economics 59 (February 1967): 93-98.

Siegel, Paul M. "Prestige and the American Occupational Structure." Ph.D. dissertation, University of Michigan, 1975.

Srole, L. "Social Integration and Certain Corollaries." American Sociological Review 21 (1956): 709-716.

Steidl, Rose E. "An Ecological Approach to the Study of Family Managerial Behavior." Proceedings of Conference on The Family: Focus on Management. Pennsylvania State University, June 30, 1969.

Strodtbeck, Fred L. "Family Interaction, Values, and Achievement." In Talent and Society. Edited by David C. McClelland, et al. New York: D. Van Nostrand Co., 1958.

Turk, James L., and Bell, N. W. "Measuring Power in Families." Journal of Marriage and Family 34 (May 1972): 215-223.

van der Veen, Ferdinand; Huebner, B., Jorgens, B., and Neja, P., Jr. "Relationships Between the Parents' Concept of the Family and Family Adjustment." American Journal of Orthopsychiatry 34 (1964): 45-55.

van der Veen, Ferdinand, and Novak, Arthur L. "The Family Concept and the Disturbed Child: A Replication Study." American Journal of Orthopsychiatry 44 (October 1974): 763-772.

Warren, Donald I. Individual and Community Effects on Responses to the Energy Crisis of Winter 1974: An Analysis of Survey Findings from Eight Detroit Area Communities. Study conducted by the Program in Community Effectiveness, Institute of Labor and Industrial Relations, University of Michigan, December 1974.

Williams, Robin M., Jr. "Values and the Family: Consensus, Conflict, and Change." Paper presented at Clara Brown Army Symposium on Family Values, University of Minnesota, March 15-17, 1970. (Mimeographed.)

Winett, Richard A., and Nietzel, Michael T. "Behavioral Ecology: Contingency Management of Consumer Energy Use." American Journal of Community Psychology, 1975. In Press.

Zuiches, James J. "Coercion and Policy Acceptance: The Case of Energy Policies." Unpublished Manuscript from Agricultural Experiment Station Project 3152: Functioning of the Family Ecosystem in a World of Changing Energy Availability. East Lansing, Mi.: Institute for Family and Child Study, Michigan State University, 1975.

Zuiches, James J.; Morrison, Bonnie M.; and Gladhart, Peter M. "Interviewing Families: Methodology and Evaluation of 'Energy and the Family' Survey." Occasional Paper No. 2, Agricultural Experiment Section, Project 3152: Functioning of the Family Ecosystem in a World of Changing Energy Availability. East Lansing, Mi.: Institute for Family and Child Study, Michigan State University, 1975.