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ABSTRACT

This study examined the relationship between the energy use for personal and family activities. Data were collected from a sample of 227 students in 11 secondary public schools in central city, suburban, small town, and rural areas. Students completed instruments that measured energy conservation attitudes, behaviors, and levels of attitudinal quality specified as affective, cognitive, and direct experience. Demographic data were also collected. Multiple regression analysis was applied to the data to determine sources of significant variance on the consistency score. Further treatment of the data to determine significant differences between selected demographic variables and the consistency score was performed using t-tests and analysis of variance. Differences in the consistency of attitude and behavior were found to be associated using both sex and employment status. No significant differences in attitude-behavior consistency were associated with the other demographic variables measured. No significant relationships existed between the attitudinal qualities measured and the consistency of energy conservation attitudes and behavior of respondents in this study. (YLB)

THE CONSISTENCY OF ATTITUDE AND BEHAVIOR BY ADOLESCENTS IN THE AREA OF ENERGY CONSERVATION

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THE CONSISTENCY OF ATTITUDE AND BEHAVIOR BY ADOLESCENTS IN THE AREA OF ENERGY CONSERVATION

One of the changes in society that has had an enormous impact on individual and family lifestyles is the realization and acceptance of the fact that all types of resources are now limited. It is recognized that resources will be limited in the future, too. In the past, conversely, a seemingly unlimited abundance of resources also affected individual and family lifestyles.

It is an accepted fact that the family determines and shapes the values that guide individual respect for and use of resources. It is noteworthy that the United States uses thirty percent of the of the world's energy but has only six percent of the world population. Keeping this in mind, it is apparent that the American family can play an important role in reducing the strain and drain on limited resources. Oil embargos and energy shortages have helped to create a new kind of conservation ethic that may be one of the most important legacies of this period.

Paolucci (1978) emphasized the potential effects of conservation of resources, including energy, within the family setting. Because the family has direct influence on individual behavior, family members can play a critical role in reducing strains upon the world's limited resources. The family's role is vital because family members control their environment and because within the family setting there is opportunity for instant and constant feedback about personal and group decisions.

Planning and developing effective strategies for the promotion and teaching of energy conservation requires a clear theoretical understanding of the relationship between attitudes toward conserving energy and actual behaviors or practices in the area of energy consumption. Yet, attitude-behavior research

continues to present complex theoretical and methodological problems for researchers.

Research Problem

Throughout the history of attitudinal theory, attitudes have been assumed to be determinants of behavior. However, researchers have been unable to validate this theory. Some researchers question the alleged evidence of inconsistency between attitude and behavior on methodological and conceptual grounds (Ehrlich, 1969; Schuman and Johnson, 1976; Wicker, 1969).

Attitude research by Rosenberg and Hovland (1960) reflects the general shift of emphasis in the study of the attitude development process. These researchers have proposed a consistency model of behavior. In this theory three components of attitude have been deined: affective, cognitive, and behavior. Rosenberg and Hovland have proposed that the parts adjust to attain consistency among the separate components. Other researchers and theorists also regard attitudes to be composed of these three qualities.

Given the lack of research and theoretical evidence to support the existence of a cause-effect relationship between attitude and behavior, researchers have begun to investigate the conditions under which consistency is likely to occur. According to Fazio and Zanna (1978), determination of the attitudinal qualities associated with consistency between attitude and behavior is an area in which more research is needed.

The paucity of proof that attitudes are strongly related to knowledge of the environment is also evident in studies of environmental issues. Kinsey and Wheatley (1980) have noted that while the positive relationship between environmental attitude and environmental knowledge is appealing, the complex nature of attitude and value formation prevents any one variable from being associated consistently with attitude change.

Studies of adolescent attitudes toward and knowledge of energy conservation in the context of environmental issues have produced conflicting results. Overall, research findings by Cohen (1973), Crater (1981), Hart and McClaren (1978), Kuhn (1980) and Steiner (1972) have been inconclusive regarding the assertion that, given accurate comprehensive environmental knowledge, attitudes toward the environment will change.

Many theorists and researchers consider that attitudes are composed of cognitive, affective, and conative or behavior components. Contradictory findings in attitude research may be attributed to inaccurate conclusions about variables which affect the consistency of attitudes and behavior rather than lack of consistency between the two. Levels of attitudinal qualities that affect the consistency between attitude and behavior have not been firmly established. Based upon significant findings, it can be concluded that consistency may rest upon the presence of certain levels of cognition, affect, and experience with the attitude object or issue in question.

Additionally, little is known about the consistency of attitudes and behaviors of adolescents with regard to energy-use decisions. The nature of the relationship remains unclear. Research findings have not demonstrated a strong link between energy-environment attitudes, knowledge, and actual practice. Understanding the consistency or lack thereof in energy-related attitudes and behaviors of adolescents within the context of personal and family use can be achieved only by dissecting the components of this complex relationship.

Therefore, the purpose of this study was to determine the nature of the relationship between energy conservation attitudes and behaviors of adolescents in energy use for personal and family-related activities. Specifically, the study was designed to determine the level of attitude-behavior consistency for

each respondent participating in the study and corresponding levels of selected attitudinal qualities.

Instrumentation

To clarify concepts related to resource conservation, it is necessary to begin by identifying adolescents' attitudes toward energy conservation and their actual behaviors and practices. A literature search in the area of home and personal energy conservation practices was conducted to generate a list of significant energy saving behaviors and attitudes.

Ninety-seven behavior items were developed in subject matter areas related to home economics. The areas included clothing selection and clothing care, food selection and food preparation, grooming and personal appearance, transportation, leisure time activities, housing, and household equipment. Consideration was given to selecting items that included behaviors appropriate for both adolescent males and females. Attitude statements corresponding to behaviors in each area were also developed. Sample items from both the behavior and attitude scales are shown in Figures 1 and 2 below:

FIGURE 1

Samples items from the Attitude-Behavior Instrument, Behavior Scale

TO THE STUDENT

People use energy in many ways in the home and for family activities. This questionnaire will help to identify ways adolescents use and save energy. Knowing more about the ways you use and save energy will be very helpful to teachers who plan future programs to better meet interests and needs of students.

Directions: Read each statement below carefully and consider your energy practices. Please check the appropriate line by using the following scale to describe your energy use.

NO OPPORTUNITY to do it
NEVER do it, but have opportunity
SOMETIMES
OFTEN
ALWAYS

		NO OPPORTUNITY	NEVER	SOMETIMES	OFTEN	ALWAYS
1.	When possible, I bicycle or walk instead of using the car.	1.				
2.	I turn off the television, radio, or stereo when not in use.	2.				
17.	I choose fun-time activities such as hiking, camping, horseback riding, and picnicking that do not require electricity or gas.	17.				
20.	I help with simple home repairs such as applying caulking or weather stripping and repairing leaky faucets.	20.				
30.	I keep the refrigerator door open only as long as necessary.	30.				
37.	When using the clothes dryer, I wait until there is a full load of clothes.	37.				

FIGURE 2

Sample items from the Attitude-Behavior Instrument, Attitude Scale

Directions: Below you will find listed several ways people can save energy in household and family activities. Please decide how you feel about each item. Use this scale.

UNAWARE of the importance
AWARE of the importance
TEND TO BELIEVE in the importance
BELIEVE in the importance
STRONGLY BELIEVE in the importance

		UNAWARE	AWARE	TEND TO BELIEVE	BELIEVE	STRONGLY BELIEVE
5.	It is important to save energy when caring for clothing.	5.				
8.	It is important to save energy when preparing foods.	8.				
9.	It is important to save energy by doing simple home repairs.	9.				
12.	It is important to save energy through your driving habits.	12.				
16.	It is important to save energy by selecting leisure time activities that do not require electricity or gas.	16.				

Eleven home economists helped to validate the Attitude-Behavior (A-B) Instrument. These individuals were secondary teachers, university faculty members, Extension agents, and home service representatives. The original 97-item behavior scale was refined and reduced to 58 items and later to 43 items. The attitude scale included 18 items in its original form; the refined version contained 16 items.

The A-B Instrument was pilot tested with 128 adolescents who were juniors and seniors in high school; male and female; and from rural, small town, and urban areas. Statistical analyses of the data showed the instrument to have acceptable levels of reliability. Alpha coefficients of internal consistency were computed for each section. The alpha coefficient obtained for the behavior section was .88, and .86 was obtained for the attitude section. These alpha coefficients are significant beyond the .001 level and indicate a high degree of internal consistency for both parts of the instrument.

Factor analysis procedures were then used to determine the items accounting for the major part of the common variance. Eleven factors accounting for 52 percent of the common variance were extracted for the behavior section. Forty-three items on the behavior scale loaded over 0.40 on the extracted factors. Five factors accounting for 1.00 percent of the common variance were extracted for the attitude scale. Sixteen items loaded over 0.40 on the extracted attitude factors.

Three attitudinal scales composed a second instrument used in the study which was designed to measure corresponding levels of selected attitudinal qualities. Qualities measured were affective commitment to energy conservation, cognitive achievement, and direct experience in practicing energy conservation. These three scales compose the Attitudinal Qualities Instrument.

The affective scale measured the degree to which respondents agreed or disagreed with energy conservation statements on a Likert-type scale of strongly agree to strongly disagree. The cognitive scale consisted of items measuring general knowledge and understanding of energy conservation. The items were adapted from items in a section of the instrument used in the National Assessment of Educational Progress --National Assessment of Consumer Skills (1979). The direct experience scale included ten energy tasks that adolescents would have an opportunity to practice. Respondents checked how often they had completed each energy task on a scale of often to never.

Validity of the Attitudinal Quality Instrument was determined by a panel of experts who judged each item according to the following criteria: 1) item suitability for measuring each attitudinal quality, 2) polarity of items, and 3) item clarity.[1]

A pilot study was conducted to establish reliability and stability estimates for the three scales measuring attitudinal qualities. Thirty-five junior and senior male and female students enrolled in two secondary public schools composed the pilot sample. A test-retest procedure was used for purposes of analyzing the stability of the three scales.

Internal consistency for each of the three scales was determined by computing the alpha coefficient for each item with the corresponding total scale score. Pearson product moment correlation coefficients were also computed for the test-retest analysis of each of the three scales. Table 1 shows the results of the reliability analyses for the attitudinal level scales.

[1] Copies of instruments used in this study may be found in Lytle, Jacque R. A study of selected attitudinal qualities and the attitude-behavior consistency of adolescents toward energy conservation (Unpublished doctoral dissertation, Texas Tech University, Lubbock, Texas, 1983).

Table 1

Reliability Analyses of the Attitudinal Level Scales

Scales	Alpha Coefficient N=35	Pearson r N=35
Direct Experience	.803***	.6948***
Affective Commitment	.693***	.5540***
Cognitive Achievement	.816***	.8089***

*** p .001

Methods and Procedures

A stratified random sample was selected that included students enrolled in eleven public high schools located in central city, suburban, small town, and rural areas of the state of Texas. Two hundred and sixty students completed instruments used in this study, and two hundred and twenty-seven responses were analyzed. The sample included both male and female students enrolled in a variety of classes in schools located within one educational regional area designated by the Texas Educational Agency. The data were collected during a one month span in October and November of 1982.

The study instruments were administered by teachers during regular classroom hours on two separate occasions. The A-B Instrument and the demographic data instrument were administered first and, after a one week interval, the Attitudinal Quality Instrument was administered to students participating in the study. All student responses were anonymous.

The dependent variable in this study was the attitude-behavior consistency score for each respondent. Independent variables included the demographic data collected and the total score on each of the attitudinal quality scales. Multiple regression analysis was applied to the data to determine sources of

significant variance on the consistency score. A two by two factorial analysis of variance was used to analyze differences in consistency scores associated with selected demographic variables. T-tests were also performed to analyze if vehicle ownership and sources of energy information were associated with the dependent variable. The relationship existing between attitude-behavior consistency and attitudinal levels was tested using correlational statistical procedures, multiple regression analysis, and t-tests for differences.

Findings

In an analysis of the relationship between scores on the five instruments used in this study, a significant positive correlation was found between attitudes and behaviors. Table 2 shows the results of the Pearson r correlational analyses of total scores on instruments used in the study.

TABLE 2

Correlation matrix of the total scores for the attitude-behavior and the attitudinal quality instruments

Instruments	Attitudes N=227	Behaviors N=227	Affective N=205	Cognitive N=20	Direct Experience N=195
Attitude-Behavior Instrument					
Attitude Scale	--	0.45***	0.20**	0.07	0.33***
Behavior Scale		--	0.12	0.16	0.48***
Attitudinal Qualities Instrument					
Affective Scale			--	0.12	0.27**
Cognitive Scale				--	0.12
Direct Experience Scale					--

** $p < .01$
*** $p < .001$

The relationship between consistency of attitude and behavior and the interval level demographic variables plus the attitudinal quality scores was assessed in a multiple regression analysis. Table 3 shows the results of this analysis.

TABLE 3

Linear regression analysis of independent variables and attitude behavior consistency scores

Sources of Variance	Regression Coefficients
D_1 (Sex)	-3.22*
D_2 (Employment)	-2.81*
Number in Household	-0.77
Occupational Status Father/Guardian	-0.01
Occupational Status Mother/Guardian	-0.01
Affective Score	0.01
Cognitive Score	0.20
Direct Experience Score	-0.46
$R^2 = 0.14$ $F = 1.21$	

* $p < .05$

This analysis revealed that sex and employment status contributed significant levels of variance upon the dependent variable -- the consistency score. Other variables in the equation did not contribute separate significant variance upon the consistency of attitude and behavior.

Further analysis of variance based upon the demographic variables showed both sex and employment status to have a significant differentiating effect upon

consistency of attitude and behavior. Table 4 shows the results of this analysis.

TABLE 4

Results of analysis of variance of attitude-behavior consistency scores based upon selected demographic variables

Sources of Variance	Degrees of Freedom	Sum of Squares	f-Values
Sex	1	230.78	5.55*
Employment Status	1	273.55	6.57**
Sex and Employment	1	405.36	9.75**
Within Groups	221	9196.02	
Total	224	10022.02	

* $p < .05$
** $p < .01$

Results of a Duncan Multiple Range Test to determine the precise source of differences showed significantly lower levels of consistency by employed males. Analysis of the variance by school attended showed no significant levels associated with this variable. In additional statistical testing using t-tests, no significant variance was found to be associated with other demographic variables including the number of persons in the household, the occupational status of parents, vehicle ownership, and sources of energy information.

Conclusions and Recommendations for Further Study

The supposition that consistency of energy conservation attitude and behavior would be associated with defined levels of attitudinal quality was not confirmed in this study. Statistical analyses of the influence of selected demographic characteristics produced mixed results. The level of correlation found between attitude and behavior replicates findings by other researchers in this area.

There was evidence that consistency was associated with the sex of the respondents. Males showed less consistency of attitude and behavior than did females. If the males had fewer opportunities to exercise the energy conservation measured here, then perhaps they did not have the opportunity to develop the qualities associated with consistency. Other researchers have also found significant differences in adolescent male and female energy conservation attitudes and behaviors.

In addition, there was evidence that employment status was associated with lower levels of consistency. It would seem that availability of a higher level of material resources could contribute to lower levels of consistency of attitudes and behaviors in the area of energy conservation. If this is true, teachers who have a high proportion of students from affluent backgrounds might meet the needs of this group by focusing upon the interdependence of conservation of resources and the well-being of all individuals and families. The ethical and ecological responsibility of individuals to use energy resources prudently should be emphasized in the classroom.

This study produced negative results regarding the influence of attitudinal qualities upon consistency of attitude and behavior. Some authors have noted that persons unaware of appropriate behaviors may have positive attitudes yet exhibit inconsistent behaviors.

Adolescents who are not aware of appropriate energy conservation behaviors may show higher levels of discrepancy. Therefore, it is important to plan educational programs that clarify appropriate and important energy conserving behaviors in personal and family-based activities.

The lack of association of knowledge of energy conservation upon consistency found with this sample adds to conflicting results obtained in other

studies. More broad based research is needed to analyze the relationship between knowledge and behavior.

This study has focused upon one aspect of the relationship between attitudes and behaviors. The findings do support the assumption that attitudes do have implications for future behaviors and also that certain demographic characteristics are associated with significant differences in consistency.

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