

Division of Research
Graduate School of Business Administration
The University of Michigan

July, 1980

Consumer/Voter Behavior in the Passage
of the Michigan Container Law

Working Paper No. 220

by

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Abstract

The landslide victory by popular vote of Michigan's "bottle bill" contradicts previous findings regarding the small size of the ecologically concerned consumer segment. A survey of voter preference conducted just prior to the election addresses this contradiction, as well as some broader aspects of consumer environmental behavior. Implications for ecological marketers are discussed.

Introduction

The problem of environmental deterioration continued to command public attention in the 1970s despite the emergence of other social problems like double digit stagflation and the energy crises. The decade witnessed major debates over such ecological issues as detergent phosphates, aerosol sprays, statewide "bottle bills," wilderness conservation, the control of automobile emissions, dam construction projects, and nuclear safety. Whether these controversies represent isolated issues involving a few activists or a broad-based environmental movement in society has yet to be determined.

During the 1970s, the notion of "ecological marketing" provided the impetus for consumer behavior research on the nature and scope of environmental activism. Ecological marketing refers to the efforts of companies and non-profit entities including government to market products, services, and ideas whose ecological attributes constitute an appeal to the buyers or adopters (Henion 1976). Ecological marketing is generally thought to involve a segmentation strategy. In order for this strategy to be successful, the ecological segment must be identifiable, accessible, and substantial. Much of the research in ecological marketing to date has attempted to determine whether these criteria can be met. The Ecologically Concerned Consumer (ECC) has been characterized as a traditional, socially responsible person (Anderson and Cunningham 1972); as socially conscious and a member of the "upper middle class counterculture" (Webster 1975); as "self-actualizing" in Maslow's terminology (Booker 1976); and as a middle-class liberal searching for a new way to express his or her values (Mayer 1976). Kinnear, Taylor, and Ahmed (1974) concluded that the ECC can be identified but that the segment is hard to reach

and probably not very large. Subsequent research in ecological marketing has generally supported their conclusion.

Given this conclusion, it is difficult to explain how environmentalists have been able to muster considerable consumer support for statewide "bottle bills" in seven diverse states since 1971. Mandatory deposit systems for beverage containers now exist in Oregon, Iowa, South Dakota, Maine, Vermont, Connecticut, and Michigan. Environmental groups oppose throwaway containers on the grounds that they squander valuable energy and material resources, that they are a major source of litter, and that they contribute to the solid waste explosion. Fuller (1978) argues that the bottle bills are a response to industry's failure to deal effectively with the throwaway container problem. However, this argument seems to imply that consumers actually "care" about the container problem and are thus ecologically concerned. In short, the theory of environmental marketing and research in the area do not seem to account very well for an important marketplace phenomenon.

The results of a deposit law referendum in Michigan serve to illustrate this apparent contradiction. In the 1976 general election the voters of that state approved by a substantial margin (64 percent to 36 percent) a proposal to require refundable cash deposits for soft drink and beer containers. The law went into effect in November of 1978. By their vote, consumers completely reversed themselves and rejected the dominant packaging form for soft drinks and beer--namely, throwaways. At the time of the election, returnable containers accounted for less than 15 percent of consumer purchases of beer in Michigan and less than 25 percent of purchases of soft drinks (Rideout and Reyes 1976). Thus, in the marketplace the demand for throwaways was strong, which is consistent with the notion that the ECC segment is small. In the

voting booths, however, a different picture emerged, with the election results indicating that the majority of consumers are ecologically concerned.

The passage of a deposit law in Michigan is perhaps more of an anomaly than its passage in some of the other states. Compared to Oregon or Maine, for example, Michigan is much more industrialized and more heavily populated. There are several major urban centers in the state and a very large working class. Clearly, it would be wrong to assume that 64 percent of the Michigan electorate is composed of "middle-class liberals" (one conception of the ECC).

The Research Objectives

The research discussed in this article centers on a survey of voter preference conducted just prior to the Michigan election. In part, the objectives of this research were applied in nature. Public opinion polls had given early warning that the deposit law was (unexpectedly) going to pass, and there seemed to be a need to explain this outcome in terms of the motives and attitudes influencing voter preference. This information was thought to be of value to the business community and to environmentalists, both of whom have a specific interest in the future of deposit laws. It has been noted that the success of a deposit law in Michigan may stimulate the passage of similar laws in other states and may eventually lead to a national law (Leigh and Warshaw 1977).

The other applied objective was to understand how environmentalists successfully "marketed" the deposit law idea to the state's population. Of particular interest was the nature of the appeal of the deposit law. It was hoped that this might provide a "blueprint" to business for the marketing of environmental products.

Theoretical objectives also guided this research. The bottle bill vote was considered to be an opportunity to further examine the structure of environmental attitudes and behavior, which has been a topic of interest to marketing academics and other social scientists for some time. Since the individuals being surveyed were acting in their roles as both voters and consumers, it was possible to integrate previous research from several fields.

The Model

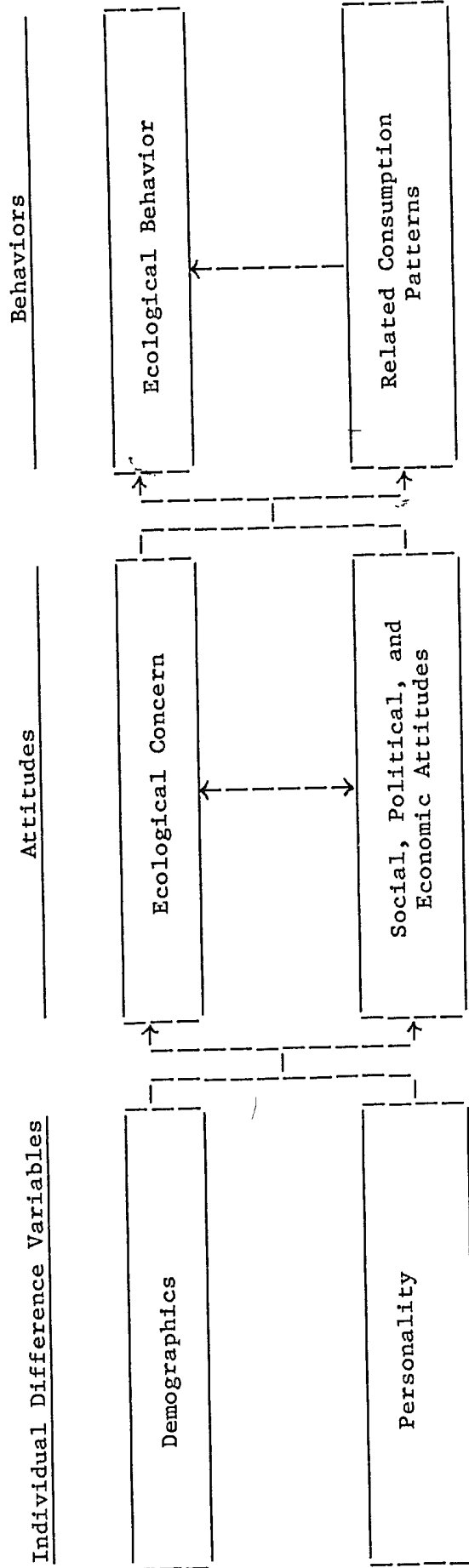
Figure 1 presents a conceptual model of relationships in the ecological attitude and behavior process. (A similar but more limited model was proposed by Webster (1976).) This model incorporates three levels of variables that may be relevant to a person's ecological orientation. The most basic variables relate to individual differences in demographics and personality. Demographics are viewed as surrogate measure for specific experiences that serve to shape a person's attitudes. The assumption is that individuals with similar demographic characteristics have shared many of the same learning experiences, which in turn lead to similar attitudes and behavior.

INSERT FIGURE 1 ABOUT HERE

Attitudes are postulated to exist as intervening variables in this model. It is assumed that individuals hold attitudes toward the environment that are separate but related to other social, political, and economic attitudes. People who hold strong positive attitudes toward the environment are said to be "ecologically concerned." The model assumes that ecological behavior can be predicted from these attitudes.

Figure 1

A 'Conceptual Model



A broad concept of attitude is used in this model. This reflects a desire to work with attitudes that are central enough to the person's identity to have an influence on behavior in a variety of settings. It also serves to increase the generality of the model. However, it is recognized that gains in generality may come at the expense of being able to predict specific behaviors very accurately (Fishbein's model is more appropriate for predicting specific behaviors; Fishbein and Ajzen 1975).

Hypotheses

The hypotheses presented below correspond to the relationships identified in the conceptual model (Figure 1). They were formulated both from specific relationships suggested by the model and from previous research dealing with these relationships.

Behavior--Behavior Links

The relationship between ecological behavior and related consumption patterns has not been systematically investigated. In the case of voting behavior on the deposit law, related consumption patterns involve the type of beverage container (returnable vs. throwaway) usually purchased for soft drinks and beer. It is assumed that consumers resist change in their consumption habits for convenience-type goods like beverages. There is considerable support for this proposition within learning theory as applied to marketing (Howard and Sheth 1969). The proposition would suggest that those who buy returnables would favor the law and that those who buy throwaways would oppose it. However, it is well known that habit is not the only influence on behavior (Hull 1952). Thus, some of those who buy throwaways might be inclined to vote for the law because they expect that certain reinforcements will

follow (e.g., a cleaner environment, cheaper prices, social approval, ego enhancement, etc.). This logic leads to the following hypotheses:

- H1: The majority of consumers who usually buy returnables will be in favor of the deposit law.
- H2: Consumers who usually buy throwaways will be split in their preference for the deposit law.

Attitude--Behavior Links

Some insight into consumers' support for the deposit law is likely to be revealed in certain attitude-behavior relationships. Predictions about the attitudinal influences on ecological behavior were derived from the marketing, political science, and environmental behavior literature. These predictions are summarized in Table 1.

INSERT TABLE 1 ABOUT HERE

Ecological concern is predicted to have a positive relationship with the ecological behavior of voting for the deposit law (H3). The consistency of ecological attitudes and behavior has been demonstrated in previous research. For example, Kinnear and Taylor (1974) found that individual attitude items in the Ecological Concern Index (ECI) correlated with environmentally relevant behaviors such as using a low-phosphate laundry product, purchasing lead-free gasoline, buying returnable bottles, and changing shopping patterns to obtain a nonpolluting product. Likewise, Antril and Bennett (1979) found a positive relationship between several measures of ecological concern and a self-reported behavioral index of ecological consumption. An attempt will be made to replicate these findings in terms of the deposit law voting preference. This study will try to establish whether the deposit law vote actually

Table 1

Predicted Relationships Linking Attitudes to Behavior

Attitudes	Relationship with Ecological Behavior
Ecological Concern	Positive (H3)
Political Liberalism	Positive (H4)
Alienation	Negative (H5)
Economic Concern	Negative (H6)
Litter Concern	Positive (H7)

reflected strong environmental sentiments among a large portion of the state's population or if other influences were more important.

Political liberalism is predicted to have a positive relationship with the ecological behavior of voting for the deposit law (H4). There is evidence in the marketing and environmental behavior literature to support this prediction. For instance, Webster (1975) summarized a number of environmentally related behaviors in his Socially Conscious Consumer Index (SCC), then used multiple and stepwise regression in an attempt to predict SCC scores from demographics, personality variables, and attitudes. Webster's model was able to account for 30 percent of the variance in the SCC when all the predictors were included. Socially concerned consumers tended to agree with the attitude statement, "big business has too much power in this country." This statement seems to reflect a liberal political orientation. Mayer (1976) interpreted this finding to mean that the ECCs are of progressive or liberal political persuasion and engage in ecological consumption as an expression of their humanitarian values.

Several studies outside of marketing have reported that political liberalism is associated with a tendency to support environmental programs (Tognacci et al. 1972; Constantini and Hanf 1972; Dunlap 1975; Koneig 1975; Buttell and Flinn 1976). Such a relationship might be expected, since most environmental programs involve some form of government intervention. A hallmark of the traditional concept of the liberal is a willingness to allow government intervention in private affairs in order to achieve broader social goals. In the case of the Michigan deposit law, the state government would be responsible for enforcing the law and keeping track of excess deposit funds.

Alienation is predicted to have a negative relationship with the ecological behavior of voting for the deposit law (H5). The concept of alienation appears similar to the variable of Perceived Consumer Effectiveness which Webster (1975) found to be correlated with the SCC. He found that socially concerned consumers tended to disagree with the statement, "it is futile for the individual consumer to do anything about pollution." This suggests that the SCCs are not alienated.

Previous studies using more direct measures of alienation have produced contradictory findings about the relationship of alienation to ecological concern and behavior. Anderson, Henion, and Cox (1974) found the ECC to be more alienated than the non-ECC. On the other hand, Nelson (1974) found the ECC to be less alienated. Anderson and Cunningham (1972) found that socially responsible persons were less alienated. It might be questioned whether these researchers all employed the same definition of alienation. The sociologist Middleton (1963) noted that alienation is not unidimensional but rather multidimensional.

One dimension of alienation proposed by Middleton was "powerlessness." This aspect of alienation is reflected in the belief that an individual can do little to help solve social problems. Another dimension of alienation noted by Middleton is "meaninglessness." This has to do with the person's feeling of being overwhelmed by the complexity of the modern world. Obviously, powerlessness and meaninglessness are related ($r = .58$ in Middleton's data). A person is unlikely to feel capable of solving social problems if the mechanisms for effecting social change are not understood.

A number of studies reported in the political science literature (Horton and Thompson 1962; Stone 1965; Aberbach 1969) have found that alienation is

associated with political negativism and a tendency to vote against referendum issues. The alienated voter is characterized as a person who "resents being powerless...is tied weakly, if at all, to organized groups...is poorly informed about the means by which power is exercised...and takes part in a referendum to vent his frustration and hostility by voting against the proposals of those who are assumed to be powerful" (Stone 1965). Taken together, the marketing and political science research suggests that a measure of alienation which incorporates powerlessness, meaninglessness, and social isolation will be negatively related to a preference for the deposit law.

Economic concern is predicted to have a negative relationship with the ecological behavior of voting for the deposit law (H6). Conservatives often make the point that environmental protection programs can have serious economic consequences. At worst, some fear that eliminating externalities like pollution may have an inhibiting effect on GNP growth. If forced to pay the full cost of products they buy, consumers would have less purchasing power. If forced to install expensive pollution control equipment, companies would have less to invest in productive facilities. Whether members of the general public see this environment/economic trade-off as clearly as intellectuals do is an empirical question.

Opponents of the Michigan deposit law employed the economic theme heavily in their advertising to defeat the law. They attempted to communicate the message that many workers in the bottling industry would lose their jobs if the law passed. They also stressed that consumers would have to pay much higher prices for soft drinks and beer as a result of the law. This advertising is likely to have sensitized at least some consumers to the environment/economic trade-off issue.

Concern about litter is predicted to have a positive relationship with the ecological behavior of voting for the deposit law (H7). This attitude has to do with people's evaluations of the seriousness of the litter problem. It might be argued that some voters viewed the bottle bill not as an environmental issue but as an antilitter law. Therefore, antilitter sentiments may have been a key determining factor in how many people voted. The inclusion of litter concern in the analysis of voting intentions may reveal something about the relative influence of global attitudes (ecological concern, liberalism, alienation, economic concern) versus domain-specific attitudes (concern about litter) on ecological behavior.

Other attitudes, no doubt, also had an influence on people's voting preferences. However, the finite limits to the length of a survey questionnaire forced some prioritizing of the attitudes to be measured. Those chosen were thought to reflect some of the major issues in the environmental marketing literature.

Attitude--Attitude Links

Only a few attempts have been made to relate ecological concern with other social, political, and economic attitudes. Even in those few cases, however, behavioral indicators of ecological concern were often used in lieu of strictly attitudinal measures.

There may not be a great need to distinguish clearly between ecological attitudes and behavior if both relate to other constructs in about the same manner. However, this condition has not yet been established. The parallel nature of these relationships is a subject of investigation in this study:

H8: The pattern of relationships linking ecological concern to other attitudes will be the same as the pattern linking ecological behavior to those attitudes.

Individual Differences--Attitude Link

Numerous researchers have tried to predict ecological concern from demographic and/or personality variables (Anderson and Cunningham 1972; Kinnear, Taylor, and Ahmed 1974; Webster 1975; Henion and Wilson 1976; Murphy, Kangun, and Locander 1978; Murphy 1978; Lepisto 1979). Demographically, the ECCs tend to be white and to have higher incomes, higher status occupations, and higher socioeconomic status, although the findings are not very consistent. Environmental behavior researchers have also attempted to measure the breadth of the ecological movement among different demographic segments of the population (McEvoy 1972; Stipak 1973; Wohlwill 1979). They find some evidence that this is largely an upper-middle-class phenomenon, but the data are again equivocal.

In three of the studies cited above it was concluded that psychological variables are better predictors of ecological concern than demographic variables (Anderson and Cunningham; Kinnear et al.; Webster). There are two plausible explanations of why demographics do not correlate well with ecological concern. One is that ecological concern is diffused among the population. An alternate explanation is that researchers have incorrectly specified the form of the relationships in their studies. Linear models were used by Anderson and Cunningham (correlation and discriminant analysis) and by Webster (multiple and stepwise regression). Kinnear, Taylor, and Ahmed used a technique sensitive to nonmonotonic relationships (multiple classification analysis), but few demographics were considered. Murphy used chi-square analysis, which is also sensitive to nonmonotonic relationships, but his study was limited to a convenience sample from a single metropolitan area (Murphy's findings did support the up-scale profile of the ECC, however). It is reasonable to expect that demographics relate to attitude in a nonmonotonic way.

Given the above considerations the following hypothesis is proposed:

H9: Without restrictions on the form of the relationships, demographics are predictive of ecological concern and behavior.

Procedure

Data

The data utilized in this study were obtained from a telephone survey of 306 voting age adults in the state of Michigan. Interviews were conducted between October 23 and October 30, 1976, with the last interview obtained three days before the election. Respondents were selected by use of a random digit dialing method similar to Waksberg's Two-Stage Procedure (Frankel and Frankel 1977). A randomization procedure was used to select among multiple eligible adults within the same household. The calling was done from a central location.

The demographic characteristics of the sample compared very well with census statistics on sex, area of residence, and age. Current figures for the income and educational attainment of the state's population were not available for comparison. The data also predicted the election outcome with a high degree of accuracy.

Multi-Item Construct Use

It is widely recognized that single-item measures of theoretical constructs suffer from serious validity and reliability problems. In this study, multi-item indices were used to measure all attitudinal constructs. When several items representing the domain of content are combined, validity increases, the specificity of the items is averaged out, and relatively fine distinctions can be made among people. As the number of items used in combination increase, measurement error is reduced and reliability increases (Nunally 1967).

Process of Item Selection, Index Construction, and Computation

Conceptual as well as empirical considerations influenced the item selection and index construction approach. Numerous items were considered for possible inclusion in the attitudinal indices on an a priori basis. Some items were retained for a priori reasons only, but many were eliminated because they were not significantly correlated with other items in the index or with the total index score. This dual approach was undertaken to assure the content and construct validity of the various indices.

The index score was computed as the average of the items that composed that index, with each item expressed in standard score form. After adjusting for variance shrinkage due to averaging, the result was a set of standardized indices with mean of zero and standard deviation of one.

Behavioral Variables

In measuring voting preference regarding the deposit law (VOTE), respondents were first exposed to the statement of the law as it was to appear on the ballot, and then asked: "If the election was held today, would you vote 'yes' or 'no' on the deposit law?" Responses to this question were coded: "yes" = 1 and "no" = 0.

Prior consumption patterns for beverage containers (CONPAT) were determined by asking respondents whether they usually purchased soft drinks and beer in returnable bottles, Nonreturnable bottles, or cans. Responses to this question were coded: "usually returnables" = 1 and "usually throwaways" = 0.

Attitudinal Variables

Five indices were constructed to measure the attitudes discussed in the conceptual model. The composition of each index is described in detail in the appendix. General descriptions are provided below.

The ecological concern index (ECI) attempts to measure the extent to which a person is concerned about protecting the environment. This index differs somewhat from an earlier version of the ECI (Kinnear and Taylor 1973). The earlier version contained both behavioral and attitudinal measures, while the current version is strictly attitudinal in nature. Four of the seven items in the current version also appeared in the original. The previous research had shown that these items were predictive of ecological buying behavior. Positive scores on the ECI indicate concern about the environment and negative scores indicate a lack of concern.

A political ideology index (LIBER) attempted to measure broadly based political orientations. The intent of this index was to determine the conservative or liberal tendencies of respondents. While more lengthy alternatives exist (see, for example, Nie and Anderson 1974; Field and Anderson 1969), LIBER does provide a reasonable indication of liberalism/conservatism in a time-saving fashion. A positive score on LIBER indicates a liberal political orientation and a negative score indicates a conservative orientation.

An alienation index (ALIEN) attempted to measure alienation as a social-psychological attitude. This basic approach is generally consistent with other research operationalizations of alienation (see, for example, Aberbach 1969; Stone 1965). Positive scores on the ALIEN index indicate feelings of powerlessness, meaninglessness, and social isolation. Negative scores indicate feelings of efficacy, understanding, and social involvement.

Attitudinal concern over the economic consequences of environmental protection was measured with the economic concern index (ECON). Economic consequences relating to prices, unemployment, and economic growth were emphasized.

Positive scores on the ECON index indicate concern about the economic consequences of environmental protection, while negative scores indicate a lack of concern about such consequences.

Concern about the degree to which soft drink and beer containers contribute to pollution, an attitude highly issue-specific to the deposit law, was measured by the LITTER index. A positive score on LITTER indicates concern about the contribution of soft drink and beer containers to pollution and a negative score indicates a lack of concern.

Demographic Variables

The demographic information collected included data on education, age, family income, sex, occupation, and geographic (urban/rural) status.

Results

Behavior--Behavior Links

In order to determine whether prior consumption habits in the purchase of beverage containers had the expected effect on voting preference, a cross-tabulation of VOTE and CONPAT was performed. The results of this cross-tabulation and a chi-square test are found in Table 2.

INSERT TABLE 2 ABOUT HERE

The chi-square results show a significant association between the two variables at the .0001 level. Also, the proportions in Table 2 agree quite well with the predictions. About 78 percent of those who usually buy returnables said they would vote for the deposit law, which is a clear majority as predicted by Hypothesis 1. This compares with a 47 percent/53 percent split

Table 2

Cross-Tabulation of Voting Preference and Prior Consumption Patterns

Voting Preference on the Deposit Law (VOTE)	Prior Consumption Patterns (CONPAT)	
	Returnables	Throwaways
Would vote yes	78%	47%
Would vote no	<u>22</u>	<u>53</u>
Total	100%	100%
(n=)	(86)	(201)

Corrected chi-square = 21.775, $p < .0001$

among those who usually buy throwaways. Such a split was predicted by Hypothesis 2.

To statistically test Hypotheses 1 and 2, the proportions in both CONPAT groups favoring and opposing the deposit law were compared with the null hypothesis of a 50 percent/50 percent split. On the basis of a simple t-test, it was possible to reject the null hypothesis ($t = 5.19$, $p < .01$) for the returnables group, which supports H1. It was not possible to reject the null hypothesis for the throwaway group ($t = -.85$, $p = n.s.$), which supports H2.

Attitude--Behavior Links

The Pearson correlation coefficient is an appropriate statistic for measuring the association between individual attitudes and behaviors, since all of the variables were intervally scaled (VOTE and CONPAT were coded as dummy variables). The meaningfulness of the correlation coefficient is somewhat limited because each attitude-behavior relationship is considered totally in isolation from the other attitudes. However, an analysis of correlations is a reasonable starting point for this type of investigation.

A complete correlation matrix of all the behavioral and attitudinal variables is found in Table 3. The correlations are duplicated above and below the diagonal of the matrix. The last column of the matrix shows the correlation of each attitude with the deposit law preference.

INSERT TABLE 3 ABOUT HERE

An analysis of these correlations, in terms of the sign and statistical significance of the coefficients, provides support for Hypotheses 3, 5, 6, and 7, but not for Hypothesis 4. Those who prefer the deposit law were found to

Table 3

Correlation Matrix of All Attitudes and Behaviors

Variables	Attitudes					Behaviors	
	ECI	LIBER	ALIEN	ECON	LITTER	CONPAT	VOTE
ECI	1.00	.31	-.08 ^a	-.32	.46	.09 ^a	.35
LIBER	.31	1.00	.13	-.10	.06 ^a	.03 ^a	.09 ^a
ALIEN	-.08 ^a	.13	1.00	.12	-.09 ^a	.08 ^a	-.19
ECON	-.32	-.10	.12	1.00	-.22	.16	-.47
LITTER	.46	.06 ^a	-.09 ^a	-.22	1.00	.09 ^a	.37
CONPAT	.09 ^a	.03 ^a	.08 ^a	.16	.09 ^a	1.00	.28
VOTE	.35	.09 ^a	-.19	-.47	.37	.28	1.00

^a not significant at $p < .05$

be more ecologically concerned, less alienated, less economically concerned, and more concerned about litter. However, contrary to the prediction, they did not appear to be more liberal. In terms of the magnitudes of the coefficients, ECON has a relatively strong negative association with VOTE ($r = -.47$), while ECI and LITTER had relatively strong positive associations ($r = .35$ and $.37$, respectively).

To provide additional insight into the attitude-behavior relationships, regression analysis using a stepwise procedure (Draper and Smith 1966) was applied to the data. As a multivariate method, regression is more informative than correlational analysis because consideration is given to both the individual and the joint effects of the predictors on the dependent variable.

The results of a stepwise regression, with VOTE as the dependent variable and the five attitudes plus CONPAT as independent variables, appear in Table 4. The independent variables are listed in the order of entry into the regression.

INSERT TABLE 4 ABOUT HERE

The "coefficient of determination" (r^2) at the final step of the regression indicates the portion of the variance in the dependent variable that is accounted for or explained by the predictors when taken together. As these results show, it was possible to explain 35 percent of the variability in VOTE by using the five variables that satisfied the entry and exit criteria.

The regression results concerning the effects of the individual attitudes and CONPAT on VOTE were very similar to those obtained from simple correlation analysis. Five of the six predictors entered the equation (ECON, LITTER,

Table 4

Stepwise Regression Analysis of Deposit Law Voting Preference

Independent Variables (In Order of Entry)	Betas (Final Stage)	F-Value (Final Stage)	Sig. of F (5,274 d.f)	r ²
ECON	-.34	41.16	.01	.22
LITTER	.20	12.23	.01	.29
CONPAT	.19	13.99	.01	.32
ALIEN	-.12	5.39	.01	.34
ECI	.12	4.28	.01	.35
LIBER	F to enter not met			

CONPAT, ALIEN, and ECI), and all five were significant at the 99 percent confidence level. The sign of the beta coefficient associated with each variable was in the predicted direction. The independent variable LIBER did not satisfy the entry criterion of $F = 1.90$. Again, these results support H3, 5, 6, and 7, but not H4.

A comment is in order about the later entry of the ECI index into the regression and the relatively low beta coefficient associated with this variable. These results contrast with the relatively high positive correlation (the simple r) between ECI and VOTE. The reason for ECI's inferior role in the regression is the multicollinearity that exists between ECI and ECON ($r = -.32$) and ECI and LITTER ($r = .46$). Because these variables share a good deal of common variance, much of ECI's explanatory power is allocated to the variables entering first. Perhaps what is most important, however, is that, even with ECON and LITTER already in the equation, ECI produced a statistically significant reduction in the unexplained variance of the dependent variable.

Partly because of this multicollinearity problem, it is difficult to tell from the correlation and regression analyses how important ecological concern was to the passage of the deposit law. It is also difficult to tell how environmentalists overcame the obstacle of economic concern in "marketing" the deposit law to the public. These issues are more easily addressed by dividing the sample into attitude segments in a manner that controls for the intercorrelations, then considering voting preferences by segment. This analysis is shown in Table 5.

INSERT TABLE 5 ABOUT HERE

Table 5

Distribution of Deposit Law Support among Attitude Segments

Segment	Attitude Profile			% of Segment Who Favor	x	Segment as % of Sample	=	Segment Contribution
	ECON	ECI	LITTER					
1	High	High	High	70%		11%		8%
2	High	High	Low	52		7		4
3	High	Low	High	39		8		3
4	High	Low	Low	16		20		3
5	Low	High	High	82		22		18
6	Low	High	Low	84		11		9
7	Low	Low	High	94		6		6
8	Low	Low	Low	41		<u>15</u>		<u>6</u>
Total:						100%		57%*
Base:						(280)		

*Actual law was supported 64% to 36%. The law was preferred by a 61% to 39% margin among total sample (n = 306). Lower figure reported here (57%) is based on subset of sample with complete data on all variables.

The three variables having the highest simple r with VOTE were used to define eight attitude segments. The mean was used as the dividing point between high and low scores on ECON, ECI, and LITTER. In addition to the attitude profile, data showing the percentage in each segment who favored the law and the size of the segment as a percentage of the sample are presented. By multiplying these two figures together, it was possible to determine how many percentage points each segment contributed to the victory of the deposit law.

Segments 1-4 evidenced a high degree of economic concern. Where this concern was "compensated for" by a high degree of ecological and litter concern (segment 1), or high ecological concern alone (segment 2), the majority favored the deposit law. However, high litter concern alone did not compensate for high economic concern in segment 3 (only 39 percent favored the law). Segments 5-8 evidenced a low level of economic concern. Except for the disinterested segment 8, there was considerable support for the law within these groups. Either ecological or litter concern was sufficient to generate majority support.

It appears from these data that the deposit law's simultaneous appeal to both consumers' ecological concern and consumers' litter concern was essential to its success. This can be demonstrated with some simple algebraic equations. Let F_i represent the percentage in segment i who favor the law and P_i represent the size of the segment as a percentage of the sample. Using this notation, the percentage favoring the law can be computed as follows:

$$\% \text{ in Favor} = \sum_{i=1}^8 F_i P_i = 57\%$$

Had the law lacked appeal to consumers' litter concern, the election results would have been much closer:

$\% \text{ in Favor} = F_2(P_1 + P_2) + F_4(P_3 + P_4) + F_6(P_5 + P_6) + F_8(P_7 + P_8) = 50\%$
Again, had the law lacked appeal to consumers' ecological concern, the election results would also have been much closer:

$\% \text{ in Favor} = F_3(P_1 + P_3) + F_4(P_2 + P_4) + F_7(P_5 + P_7) + F_8(P_6 + P_8) = 49\%$
Finally, had the law lacked appeal to both consumers' ecological and litter concern, the deposit law would have been defeated:

$$\% \text{ in Favor} = F_4(P_1 + P_2 + P_3 + P_4) + F_8(P_1 + P_2 + P_3 + P_4) = 30\%$$

Attitude--Attitude Links

Hypothesis 8 deals with the equivalence of ecological behavior and ecological concern. The question is whether there is a need to distinguish clearly between these constructs.

Hypothesis 8 is most easily addressed by comparing the first and last columns of correlations in Table 3. The first column shows the correlations between ECI and the other attitudes. The last column gives similar information about VOTE. Minor differences in the magnitudes of the correlations are not as important as any differences in the sign and/or statistical significance of the coefficients. Both ECI and VOTE were found to be positively correlated with LITTER and both were negatively correlated with ECON. However, that appeared to be the extent of the similarity. LIBER was found to be positively correlated with ECI but it was uncorrelated with VOTE. ALIEN was found to be negatively correlated with VOTE but it was uncorrelated with ECI. On the basis of these data, it seems that ecological concern and ecological behavior are not equivalent and that Hypothesis 8 can be rejected.

For comparative purposes, a stepwise regression was run with ECI as the dependent variable and the four other attitudes as independent variables. The results indicate that 33 percent of ECI variance is accounted for by three

significantly related attitudes ($\alpha = .001$). In order of inclusion, these variables were LITTER, LIBER, and ECON. Only ALIEN failed to contribute significantly to the regression. The beta coefficients associated with these variables supported the correlation analysis. The stepwise regression shows that ecological concern is a construct separate from the other attitudes, since 67 percent of the variance in ECI was unaccounted for, but it is definitely related to them.

Individual Difference Links

Multiple classification analysis, or MCA (see Andrews et al. 1973), was used to measure the influence of five demographic variables on ECI and VOTE. MCA is a multivariate procedure that is appropriate when the dependent variable is intervally scaled but the predictors are only nominally scaled. The MCA model is additive and can accommodate nonmonotonic relationships between the predictors and the dependent variable.

Table 6 reports the results of the two MCA runs. The predictors in each run were sex, education, income, area of residence, and age. The joint effects of the predictors can be assessed by noting the multiple r 's at the bottom of the table. These were relatively low for both ECI ($r = .14$) and VOTE ($r = .31$). Even for VOTE, where the best fit was obtained, the model accounted for only about 10 percent of the variance. These results do not support Hypothesis 9.

INSERT TABLE 6 ABOUT HERE

Analysis of variance (ANOVA) was used to determine whether any of the individual predictor effects were statistically significant. Area of residence

Table 6

MCA Results Relating Ecological Concern and
Voting Preferences to Selected Demographics

<u>Variable</u>	<u>Categories</u>	<u>n</u>	<u>ADJUSTED COEFFICIENTS</u>	
			<u>ECI</u>	<u>VOTE</u>
Sex	Female	133	-.01	-.04
	Male	120	.01	.05
Education	HS or Less	141	-.04	-.06
	Some Coll or Tech	69	.03	.06
	Coll Grad or More	43	.08	.11
Income	\$0 - \$9,999	75	.15	.01
	\$10,000 - \$19,999	130	-.06	.00
	\$20,000 and Over	48	-.09	-.01
Residence	Detroit SMSA	119	.08	-.05
	Other SMSA	77	-.04	-.06
	Town or Farm	57	-.12	.19
Age	35 and Under	118	-.05	-.05
	36 - 55	82	.07	-.02
	56 and Over	53	.01	.15
Multiple r			.14	.31

was found to have a relatively strong effect on voting preference (significant at the 99 percent confidence level). Voters not living in an SMSA were more likely to support the law (75 percent) than those living in the Detroit/Ann Arbor SMSA (52 percent) or some other SMSA in the state (49 percent). Age had a weaker effect (90 percent confidence level) on voting preference with voters fifty-six and over more likely to approve the deposit law.

Discussion

Applied Issues

The analysis provided some important insights into the nature of consumer support for the deposit law and the factors that influence ecological behavior. Implications can be drawn regarding the future for deposit laws in other states and regarding effective methods for marketing ecological consumer products.

It is reasonable to assume that most consumers based their preference for the law on an assessment of the probable costs and benefits of the law's passage. Costs of apparent concern to these voters were adverse economic consequences such as higher prices, more unemployment, and slower growth. Still, many consumers seemed willing to support the law on the grounds that the benefits exceeded the costs. Benefits of concern to these voters were both generic (e.g., protection of the environment in all its many facets) and specific (e.g., a reduction in unsightly litter). Apparently, by stressing both generic and specific benefits, environmentalists were able to gain passage of the law.

If Michigan is any indication, future deposit law debates are likely to involve heavy promotion and publicity warfare between business and the

environmentalists. Business will attempt to appeal to the consumers' economic concern and the environmentalists will attempt to appeal to the consumers' ecological and litter concern. The task of the environmentalists is made more difficult by the fact that soft drink and beer prices are noticeably higher in states with these deposit laws. One factor that influenced Ohio voters to turn down a deposit law in 1979 was the awareness of higher prices in the neighboring state of Michigan.

While economic concern may be the preeminent issue, industry should not discount consumers' concern about the environment and the litter problem. Both were important factors to the passage of Michigan's deposit law, however, when industry has been able to neutralize those concerns, the deposit law has usually been turned down. For example, a bottle bill was defeated in Nebraska in 1978 partly because of an effective slogan used in industry advertising: "The Bottle Bill--Right Problem But Wrong Solution."

The results also indicated that many of those who preferred the container law were not in the habit of buying returnables and were actually voting for something of an unknown in supporting recycling. Future participation in the deposit system may or may not conform with their expectations about inconvenience, price effects, reduction in litter, etc., which will ultimately determine their satisfaction with it. This places a heavy burden on providing a high level of customer service in the reverse channel of distribution.

The passage of the deposit law may offer environmental marketers some guidance in marketing ecological products. First, it is apparent that consumer habits are not all powerful and that they are capable of being changed given the proper appeal. The initial task is to get consumers involved and thinking about the purchase decision. This was accomplished in the case of

the deposit law by heavy publicity. Second, it is necessary to sell the product on the basis of more than just ecological concern. If ecological concern is the primary appeal, then the market will be limited to a smaller group of consumers who have the requisite knowledge to evaluate the importance of the claims being made (e.g., energy conservation, resource conservation, solid waste reduction, etc.). At a very minimum, the ecological attributes of products should be translated into specific ecological benefits immediately recognized by most consumers (e.g., litter reduction). If, in addition to the generic and specific ecological benefits, the product is also superior on one or more non-ecological attributes, then demand will be that much greater (Arndt and Helgesen 1979).

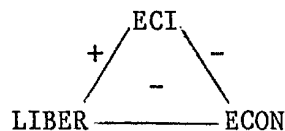
Theoretical Issues

The conceptual model in Figure 1 was generally supported by the research results, although some linkages within the framework were more strongly supported than others. Prior consumption patterns were found to be related to ecological behavior. Most of the attitude-behavior relationships and some of the attitude-attitude relationships were also found to exist. However, no link could be established between demographics and either ecological attitudes or behavior.

The findings indicated that there is a need to distinguish between ecological variables that are behavioral in nature and those that are attitudinal in nature. Failure to make this distinction in previous research may explain why contradictory findings are often obtained. In this study, a comparison of the attitudinal correlates of ecological concern with the attitudinal correlates of ecological behavior suggested that the ECC segment is not homogeneous

but composed of both "doers" and "talkers." For example, ECI was found to be positively correlated with liberalism while VOTE was not. These findings imply that some ECCs express an ecological sentiment mainly because it is consistent with their liberal political views. On the other hand, a decision to engage in ecological behavior reflects a higher degree of commitment. A distinction between verbal commitment and actual commitment has previously been made (Maloney, Ward, and Braucht 1975).--

There was evidence that respondents maintained a certain degree of ideological consistency among their attitudes. For example, a familiar pattern of interrelationships was obtained for three of the attitudes:



At the same time, ecological concern was found not to overlap completely with these other attitudes and seemed to be a distinct construct. Approximately one-third of the variance in ECI was accounted for in a regression of ECI on the other attitudes. This may be important, since it implies that ecological concern can be manipulated without having to alter the entire attitudinal fabric of the person (Wohlwill 1979). A strategy of manipulating the level of ecological concern through information and education might be considered by environmentalists and ecological marketers.

Finally, the inability of the very general demographic predictors to account for a reasonable amount of variability in ecological attitudes and behavior is consistent with the results of previous research. There was no evidence to support the claim that the environmental movement is an upper-middle-class phenomenon. This finding is encouraging with respect to the potential size of the ECC segment, but discouraging with respect to the design of effective promotional strategies, given the present size of the ECC segment.

Appendix

Composition of Attitudinal Indices

Ecological Concern

- willingness to sacrifice laundry whiteness or brightness in order to use a non-polluting laundry soap.
- importance placed on pollution as a problem in the U.S.
- willingness to urge friends to not use products that pollute.
- the degree of personal interest in the pollution aspects of purchased products.
- interest in requiring a deposit on food cans, grocery bags, plastic milk cartons, or other glass containers.
- feeling about the future habitability of the earth by the year 2000.
- feeling about the degree to which different products, institutions, and other sources are major, minor, or negligible contributors to pollution.

Political Liberalism

- presidential candidate preference.
- attitude toward governmental intervention in the marketplace.
- the political orientation of organizations in which the respondent holds membership.

Alienation

- feelings about personal ability to do something about today's important problems.
- feelings about their ability to understand the world around them.
- feelings about being responsible for the kind of world passed to the next generation.
- feelings about having little in common with the majority of people in the U.S.
- intention to vote/not vote in the general election.
- number of memberships in social/political organizations.

Appendix (cont.)

Economic Concern

- expectations concerning the impact of the deposit law on the price of soft drinks and beer.
- expectations concerning the impact of environmental protection on the level of employment.
- willingness to accept a slower rate of economic growth if it would help improve the environment.

Litter Concern

- feeling about the degree to which soft drink containers are major, minor, or negligible contributors to pollution.
- feeling about the degree to which beer containers are major, minor, or negligible contributors to pollution.

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