A COMMUNITY EXPERIMENT IN DISSEMINATION MODELS FOR CITIZEN ENVIRONMENTAL ACTION

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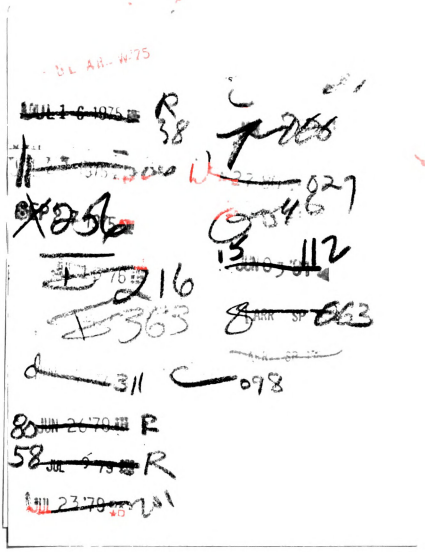

ABSTRACT

A COMMUNITY EXPERIMENT IN DISSEMINATION
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By

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The need for citizen participation in environmental action was briefly discussed. After reviewing current efforts, it was concluded that there are presently no empirically tested dissemination models for promoting citizen environmental action. Three different dissemination methods were formulated and experimentally tested in a community setting.

The results indicate that merely sending a person an action-oriented newsletter and additionally sending the newsletter to her two adjacent neighbors were ineffective treatments for engaging middle-class citizens in environmental action. A newsletter plus a personal telephone contact by a change advocate was found to be a significantly effective method.

Various attitudinal, demographic, and diffusion correlates of environmental activities were analyzed and discussed. Recommendations were made for organizations involved in the dissemination of environmental action information and for future research in the area of environmental action.

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By

John William Lounsbury

A DISSERTATION

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To Karen and Kirsten

To Karen and Kirsten

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I. INTRODUCTION

The Problem

In recent years there has been a great deal of attention focused on ecological problems and the deteriorating quality of our total environment. Much information has been generated to characterize the many facets, complexities and degrees of extremity of environmental problems (e.g., Ehrlich, 1968; Ehrlich and Ehrlich, 1970; Gordon, 1967). Furthermore, many proposals for environmental action have been set forth (e.g., Mitchell and Stallings, 1970; Saltonstall, 1970). While actions directed toward the improvement of environmental conditions can take many forms, there is a great need for the private citizen to direct his personal actions toward the reduction of environmental degradation.

There are many areas in which an individual can contribute to the goal of improved environmental quality. For example, as a political constituent he can indicate his stand on issues which are relevant to environmental matters. Actions in this area might include voting on key issues, writing one's elected officials in support of specific bills, and joining voluntary associations which lobby for conservation and environmental quality. An individual might also choose to join an ecological action group which attacks local problems. On an

interpersonal level, he can educate his peers and his relatives about environmental issues. Also, and perhaps most importantly of all, as a purchaser and user of products and resources an individual can actively reduce (or increase) his personal contribution to environmental pollution and the deterioration of environmental quality. Thus, one might purchase ecologically sound products and recycle the residues of these products once they have been used. The possibilities for personal action in and around the home are many.

Unfortunately, there is little evidence to suggest that significant numbers of citizens are currently engaged in behaviors aimed at the reduction of ecological problems. The words of John Gardner (1969) seem to typify the public state of mind toward the environment:

> "As we enter the 1970's, there are many curious aspects of our situation, but none more strange than our state of mind [about the environment]. We are anxious but immobilized. We know what our problems are, but seem incapable of summoning our will and resources to act."

At the present time there are no well-defined models of persuasion which outline the most appropriate courses of action. There is, of course, the overreaching need to transmit action information to the people. For example, federal agencies such as the Environmental Protection Agency (EPA) and state and local organizations working in this area have at best adopted the unevaluated general strategy which might be depicted as -- "to get the citizenry involved, give them more information." As a result, there has been a virtual flood of printed materials, including those which, for example: exhort people to adopt a "new environmental ethic" (EPA, 1971); urge them to organize into

citizen action groups (EPA, 1972); go on wilderness outings (Mackinac Chapter Sierra Club, 1972); alert them of endangered plant species (Environmental Action for Survival, 1971); and tell them of ways to reduce fuel consumption in household heating (Office of Consumer Affairs, 1971).

Unfortunately, none of these efforts to transmit information and increase environmental awareness and action have undertaken systematic assessments of their actual impact. Put another way, it is unclear to what extent the mere transmission of information about environmental action has *any* effect upon citizen action. Following the work of Fairweather (1967, 1970, 1972) and his associates (1973), this research will adopt a field experiment approach to answer this and other related questions. For present purposes, it is held that the most productive approach to the solution of significant problems facing mankind is accomplished by: 1) formulating innovative, humanitarian, realistic and socially acceptable solutions to a problem; 2) experimentally evaluating comparable alternative models in a small-scale naturalistic setting (e.g., at the community level); and 3) implementing successful models in the larger social system (e.g., at the national level). The specific purpose of this investigation is to provide an experimental study which evaluates the relative efficacy of four different models for engaging individuals in behaviors which contribute to the regulation of environmental quality.

Effectiveness of the Written Word

One of the generic questions to be addressed by this research is the utility of written material in conveying action-oriented environmental information. There are a number of practical, empirical, and conceptual reasons for evaluating this procedure. On a practical level, printed information as in the form of a pamphlet or a newsletter can be a relatively inexpensive method of communicating information and it can be relatively easily organized for dissemination to large audiences (Havelock, 1971, Chap. 9). In addition, simple exposure to printed information has been shown to be a differentiating variable between adopters and non-adopters of innovations. For example, Clausen and his colleagues (1954) found that mothers who consented to have their children vaccinated by the Salk polio vaccine received more information about the vaccine through newspapers, magazines, and instructive leaflets than mothers who did not consent to have their children vaccinated. Palmore (1967) reports on a study of diffusion of family planning information in which printed information was found to have stimulated person-to-person communication which in turn influenced the adoption of new family planning practices. However, it should be noted that neither of the above studies was concerned with environmental action. While printed information may facilitate behavior change in the areas of polio vaccination and family planning, that does not mean that it will be effective in creating environmental action.

Furthermore, some studies have not found printed information to be of any benefit in persuading people to adopt innovations. For

example, in a family planning study in Taiwan (Freedman and Takeshita, 1969), the use of personal letters was an ineffective means of inducing married women to accept birth control methods. Since the target population in this study was not highly literate, and since there was no ancillary mass media support for innovations, the results from the Taiwan study regarding printed information may not be applicable to the current context. In a somewhat different vein, Fairweather *et al.* (1973) found that the transmission of instructional brochures was of almost no value in persuading hospitals to implement an innovative model for treating mental illness. It is possible that these findings may not be relevant to environmental action since the innovation requested for adoption by Fairweather *et al.* involved the complete reorganization of staff and patient roles in a radically new treatment program for the hospitals. By comparison, the innovations in the present study involve relatively small-scale personal behaviors.

In summary, the empirical evidence regarding the effectiveness of printed information is inconclusive. Not only are the findings of the above studies conflicting, but also none of these studies dealt specifically with the topic of environmental action. What is needed is a test of the usefulness of the written word in disseminating environmental action information.

The Effectiveness of Change Advocates and Personal Contacts

Change advocates are familiar to us in a number of roles in contemporary society. Thus, the advocates of change, whose task it

is to facilitate or effect change, include such varied types of persons as Peace Corps volunteers, missionaries, salesmen, political precinct workers, and agricultural extension agents (cf., Arensberg and Niehoff, 1964; Barnett, 1953, Chap. 10; LaPiere, 1965, Chap. 5). The influence of a change advocate is often critical for the success of an innovation. By way of illustration, Rogers and Shoemaker (1971, pp. 233-234) report on a three-nation comparison of the relative success of planned agricultural change in dozens of communities where it was found that the promotional activity of a change advocate was the key factor in successful innovation diffusion. In a five-year quasi-experimental study of township agricultural extension agents (Nielson, 1967; Nielson and Crosswhite, 1959), it was found that increased contact with farmers led to increased adoption of improved agricultural practices, which led to increased agricultural output and greater farm earnings. Also, in a controlled field experiment, Fairweather and his colleagues (1973) found that the influence of a change advocate was critical for the activation by mental hospitals of an innovative treatment program.

The idea of personal interaction between the advocate for an innovation and the person for whom change is intended is central to the notion of a change advocate in innovation adoption and behavior change. Along these lines, several authors (e.g., Bem, 1970; Clark, 1962; Havelock, 1971; Niehoff, 1966; Rubin, 1968; Westley, 1965) have discussed the importance of personal contact in facilitating planned behavior change. Moreover, there is no lack of empirical studies which have demonstrated the change utility of personal contacts (see, for example,

Coleman *et al.*, 1966; Eldersveld and Dodge, 1954; Niehoff and Anderson, 1964; Roberts and Larsen, 1971). By way of illustration, in the study reported by Eldersveld and Dodge (1954), personal visits to homes were found to be more effective in persuading people to vote for a revision of a city charter than a mail-campaign and a no-treatment control group.

The type of contact in the aforementioned examples was of a face-to-face variety, which was usually of a fairly intense nature and repeated on more than one occasion. For instance, in the agricultural extension agent study reported by Nielson (1967) and Nielson and Crosswhite (1959), the face-to-face interaction between the farmer and agent was repeated an average of seven times a year for five years. Given current state and federal economic priorities, it is clear that such extensive personal contacts are not feasible in the environmental action sector, where advocates would have to visit thousands of homes in a single moderately-sized city such as Lansing, Michigan, to establish face-to-face contact with even a fraction of the total population.

In light of these economic limitations, a dilemma is apparent. On the one hand, the effectiveness of personal change advocacy seems established in the literature; on the other hand, the typical extensive form of change advocacy is economically prohibitive. What needs to be found is a change advocacy tactic which is both effective and inexpensive enough to be of some usefulness in promoting environmental action.

Along these lines, it is interesting to note that several studies have demonstrated the potential of telephone advocacy, a

relatively inexpensive advocacy medium. Telephonic advocacy has been fairly conclusively shown to facilitate behavior change in certain situations. For example, several studies (Donald, 1960; Eckland, 1965; Levine and Gordon, 1958; and Suchman and McCandless, 1940) have shown that telephone "prodding" can be successfully used to persuade non-respondents to complete and return survey forms.

The Effectiveness of Informal Communication Networks

A well-established finding in psychology is that the frequency of social contact, degree of interpersonal communication, and frequency of friendship occurrence (and even marriage choices) is directly related to opportunity for interaction (Byrne and Buehler, 1955; Caplow and Forman, 1950; Festinger *et al.*, 1950; Maisonneuve *et al.*, 1952). To illustrate this point, in a study of a married students' housing project, Festinger and his coworkers (*op. cit.*) discovered that there was a direct relationship between frequency of informal contact, friendship choices and cliques, and the variable of residential propinquity. That is, for example, friends tended to be neighbors, especially adjacent neighbors. Along these same lines, Whyte (1956) found that social contact in a suburban residential development was a function of geographic nearness. Similarly, Gouldner and Gouldner (1963, pp. 328-355) present evidence which shows that marriages occur most frequently between men and women who live close together, while they occur least frequently between men and women living at great distances from each other.

Given these results, it is not surprising, then, to find that spatial arrangements and informal communication networks also affect the adoption and diffusion of innovations. To illustrate, Clausen *et al.* (1954) found that mothers who consented to allow their children to be vaccinated by the Salk polio vaccine more frequently discussed the shots with neighbors and friends than did non-consenting mothers.* Also, Sills and Gill (1958) found a curvilinear relationship between size of community and rate of vaccination by the Salk vaccine. They hypothesize that "in both small towns and large cities people's opportunities for seeing other people, and for discussing with them such topics as health and vaccination, may be more limited than they are in medium-sized cities" (*ibid.*, p. 251) where informal interaction may be more frequent. The best illustration of the positive relationship between geographical propinquity and innovation adoption comes from a study by Whyte* (1954) who found that the distribution of air-conditioners observed to be protruding from houses followed a cluster pattern wherein conditioners were usually found in clusters of adjacent neighbors. The clusters seldom went across streets; rather, they extended mainly up and down the sides of blocks. Whyte concluded that the clusters were the symbols of powerful communication networks, through which the innovations (air-conditioners) diffused.

Purpose

The present study represents an experimental test of the three issues discussed above. To examine the effectiveness of the printed

word in promoting environmental action, a standard "eco-action newsletter" was used to convey information about environmental problems and practices and was compared to an absence of this treatment.

Recognizing the importance of an advocacy role and personal contacts in behavior change and innovation adoption, and taking into account the expense incurred in making personal contacts, it was decided to use telephoning as an advocacy medium for innovations disseminated in the newsletter. Accordingly, in the present experiment, subjects in a "prod" condition received the newsletter and at regular intervals were contacted by phone by a change advocate who discussed problems, gave suggestions and advocated adoption of environmental practices.

In an effort to test whether the informal communication networks of neighbors can be utilized to significantly facilitate the adoption of practices suggested in the newsletter, the current study used as an additional independent variable the sending of newsletters to a person's immediate neighbors. Thus, a subject in a "send-to-neighbors" condition received the newsletter as did her two adjacent neighbors (i.e., neighbors on both sides of her dwelling on the same side of the street). The rationale for such a treatment is that sending the newsletter to neighbors may induce informal discussion of, and possibly group support for, the adoption of environmental practices.

Experimental Hypotheses

There are three major issues about citizen involvement in environmental action which are addressed in this research: the

effectiveness of a newsletter, the effectiveness of change advocates and personal contacts, and the effectiveness of informal communication networks. Specifically three directional hypotheses are advanced:

Hypothesis 1. An information dissemination approach in the form of the eco-action newsletter will be more effective in involving citizens in environmental action than no systematic effort.

Hypothesis 2. Those conditions in which subjects are contacted by a change advocate will display greater participation in environmental action than conditions not receiving personal contacts by an advocate.

Hypothesis 3. Subjects in the send-to-neighbors conditions will be more involved in environmental action than subjects not in these conditions.

In addition to testing these three hypotheses, another goal of the present study is to explore the relationship of various attitudinal demographic and diffusion variables to the adoption of environmental action practices. There is some research (cf., Spaulding, 1967, 1972) which suggests, for example, that personal beliefs and attitudes as well as demographic characteristics (e.g., socio-economic status) may be associated with environmentally-related behaviors. Thus, it is also the aim of the present investigation to explore such relationships.

II. METHOD

Subjects

Subjects for this study were 185 female middle-class (defined by membership in census tracts and blocks having above-average property values[1] for housing units) Lansing residents living in single-unit dwellings. Single-unit dwellings (e.g., a house) were selected for participation in the experiment in preference to multiple-unit dwellings (e.g., an apartment house) because the occupants of single-unit dwellings are more likely to be personally responsible for the maintenance and costs of their utilities and solid waste disposal.

Sampling

Using 1970 census tract data, a form of two-stage cluster sampling (Cochran, 1963) of above-average blocks from above-average income tracts was accomplished with two units being chosen per block, on opposite sides of the block. The first stage of sampling involved selecting a random sample of above-average census tracts in the Lansing, Michigan, metropolitan area. The second stage involved random sampling of above-average blocks in the selected tracts. Finally, houses were randomly selected from the blocks chosen in the second stage.

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[1]In this context, "above-average" refers to the average property value for Lansing, as defined by 1970 census data -- $17,800.

Names, addresses, and phone numbers of householders were obtained from the Lansing City Directory (1972) and Bresser's Cross-Index (1972). The nature of these two sources dictated two types of constraints on the households selected for the study: 1) The householders were persons who had voluntarily and accurately filled in survey forms utilized in compiling the City Directory. 2) They had registered a motor vehicle in the state of Michigan, from which the Cross-Index information was derived. Furthermore, two additional constraints were placed on the random selection procedures: householders had to have a listed telephone number (so that prod calls could be made) and a subject's dwelling unit could not be located on a corner or end of a block. The latter restriction was due to an experimental condition -- send-to-neighbors -- since one of the adjacent neighbors would have to be selected on a different street if the center household of three were located on a block corner or the end of a street. Using the above procedure, the initial pool of subjects was chosen.

Design

The conditions and experimental design for this study are shown below in Table 1. The experiment is cast in a two-by-two factorial design with a single control group (Winer, 1962).

In an effort to control for potential differences between conditions on the target behaviors as a function of socio-economic status, the experimental conditions were matched on average property value for

TABLE 1. The Five Experimental Conditions Used in the Current Study

CONDITION	No-Prod	Prod	
No Send-to-Neighbors	Condition 1 (n = 35) (n' = 24)	Condition 2 (n = 35) (n' = 32)	Treatment Control
Send-to-Neighbors	Condition 3 (n = 35) (n' = 21)	Condition 4 (n = 35) (n' = 29)	Condition 5 (n = 45) (n' = 35)

Note.--In each cell, n indicates the number of subjects originally assigned to the condition; n' indicates the number of subjects on whom the dependent measures of environmental action were taken.

the block, with nearly[2] equal numbers of "higher" (above the sample median) and "lower" (below the sample median) blocks being represented in each cell. After matching on this variable, each of the 185 subjects were randomly assigned to one of the five conditions.

The design for this experiment is a *post-only* design (Kerlinger, 1964). In other words, measures were taken on the dependent variables after the experimental manipulations were performed. Pre-test measures were not included in this design for three reasons: 1) pretesting may have created a possible interaction effect for some or all of the treatment conditions with the treatment process itself (*ibid.*, pp. 310-311); 2) pretesting may have increased the probability that subjects perceived the newsletters to be an integral part of an experiment, thereby introducing the possibility of a reactivity effect (to be discussed below); and 3) pretesting would have involved additional time and money which was not available for this study.

Materials

The newsletter used for the four main experimental conditions was entitled the Eco-Action Newsletter. Each of the Eco-Action Newsletter issues was at least seven pages long and contained articles about environmental problems and suggestions for specific practices which the individual could adopt to help reduce these problems (see Appendix A). It was constructed so that it was representative in content to similar

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[2]Since there was an odd number of units in each cell, the determination of the extra unit was made by random assignment. All cells did, however, have at least 17 units from both "higher" and "lower" blocks.

publications by local and national environmental action groups. Each of the practices advocated in the Eco-Action Newsletter involves some specific behavior referenced against some specific object or class of objects (e.g., the recycling of paper) with detailed directions given for carrying out the behavior (e.g., instructions were given for bundling paper and the addresses of local recycling stations were listed). Assuming that such practices were novel to the individuals receiving the newsletter, and using a conventional definition of innovation as "anything perceived to be new by the potential trier, the adoption of which would alter the trier's pattern(s) of behavior" (Engel *et al.*, 1969), these practices can be called *innovations*.

The general format of most sections in most issues of the newsletter followed in principle three stages of a persuasion paradigm presented by Brown (1963, p. 77), wherein the material is aimed at getting attention, creating arousal, and relieving tension through the acceptance of a persuasive appeal. Thus, it was believed that attention would be drawn to the problem through the use of italicized headings, figures, tables or symbols and that the severity of the general problem could be highlighted by outlining its effects (usually disastrous if current trends were to continue). Finally, specific actions to be taken to reduce the problems were recommended.

The newsletter focused on just those environmentally-related actions which can be performed by an individual in or around her home or in the course of normal daily activities such as purchasing groceries.

For example, home-based environmental actions of this nature include reducing household water and fuel consumption.

Since there are many important areas of environmental activities even in this single domain, the present study investigated environmental action for at least one activity in each of four of the most salient problem areas: solid waste disposal, energy consumption, and air and water pollution. For measurement purposes indicators of action in these areas were such that they could be specified in relatively explicit behavioral terms. As an example, "placing a brick in the water tank of one's toilet" was selected as an indicator of water conservation rather than "using less water when bathing."

Procedure

All subjects in the four main experimental conditions received by mail an introductory letter (Appendix B) followed by the Eco-Action Newsletter mailed approximately once every three weeks for 15 weeks; then four weeks later, data collection was initiated. Table 2 depicts the time frame for the complete experiment.

In the send-to-neighbors conditions, Eco-Action Newsletters were sent simultaneously to the two adjacent neighbors for each subject. In the prod conditions, the subject was contacted twice during the mailout of the newsletter by a prod agent. The purpose of the call was to reinforce the main message of the newsletter (i.e., adopt innovations) and discuss any problems or other issues related to environmental action with the subject. The basic format for the prod calls (see Appendix C

TABLE 2. Project Time Frame

Time Frame	Activity
0 weeks	Send out introductory letters to subjects.
1½ weeks	Send first issue of newsletter
4½ weeks	Send second issue.
6 weeks	Make first prod call.
7½ weeks	Send third issue.
10½ weeks	Send fourth issue.
12 weeks	Make second prod call.
15½ weeks	Send fifth issue and pre-follow-up letters.
19½ weeks	Begin follow-up interviews.
28 weeks	Finish follow-up interviews.

for a more detailed description) was identical for both prod conditions.

The data collection procedure entailed several phases. First, a letter was sent to potential respondents informing them of the intended home visit and survey (see Appendix D). Next a respondent was visited at home by a member of the research team, presenting himself as a member of the same organization which mailed out the newsletter, the Michigan Student Environmental Confederation (a local environmental action organization). The survey form consisted of two separate parts, one questionnaire containing a behavioral checklist for innovation and a second questionnaire with various items relating to attitudinal, demographic and diffusion information, to be described in greater detail below. The survey was self-administered by the respondent; however, two different procedures were utilized for the two questionnaires. The first questionnaire, dealing with the items of primary interest for the study, was given to the subject with the interviewer present. The interviewer's presence was used to: 1) introduce the survey form to the respondent; 2) establish rapport; and 3) clarify items and answer the respondent's questions about the survey form. The longer, second questionnaire was left with the respondent to complete. It was indicated to the respondent that this form was to be collected two days later by a second home visit. Stamped, return-addressed envelopes were provided for those respondents who wished to mail in their forms. Also, a mail format was used to administer survey forms to subjects who moved during the course of the experiment, when

their new address was known. If necessary, a follow-up letter was used in the situation where forms were to be mailed in to urge non-respondents to return the completed questionnaires (see Appendix E).

One of several restrictions which a limited amount of funding placed on this study was the shortage of money for interviewers. Consequently, one Michigan State University work-study student (a 20-year-old Caucasian male) distributed and collected nearly 75 percent of the surveys. Enough funds were not available to continue his efforts through the duration of the study, nor were funds available for additional paid interviewers. Hence, the remaining 20 percent of the surveys were managed by the principal research investigator who was also the prod agent (with 5 percent of the forms being completely administered via mailouts). An effort was made to minimize the percentage of surveys handled by the latter person since it seemed possible that prod-condition respondents might give different responses to items due to familiarity with the prod agent.

Since data collection proceeded over a period of several weeks, and since it was possible that innovation adoption within a household might vary over a period of time as short as a week, it was felt to be necessary to counterbalance the order of actual initial contacts with a subject against the five conditions in the following manner: Initial contacts were made with an equal number of subjects in each condition for each seven day period during data collection. Furthermore, an attempt was made to equate the relative proportions of subjects surveyed by each of the two interviewers across the five conditions.

To reduce the possibility of a response bias due to a reactivity effect (cf., Webb *et al.*, 1966; Rosenthal, 1969), the contact with the subject during the data collection process was structured in such a way as to try to avoid a situation in which the subject felt that she personally was being evaluated. For example, if the respondent felt that her behavior was being assessed, she might have tried to bias her responses in such a way as to inflate the observed treatment effect (e.g., she might have tried to "look good" in the eyes of the interviewer). Or, if the subject viewed the situation as an unreasonable attempt to influence her behavior, she might have resented the measurement questions and have given purposely false responses. Therefore, subjects were told that the purpose of the follow-up interview was to investigate their reactions to the newsletter and feelings about various aspects of the environmental issue. It was stressed that their feedback was essential for an adequate evaluation of the newsletter, and that their comments would be used to determine whether the program should be continued and expanded on a broader basis in the future. Emphasizing the importance of a subject's feedback probably also helped to insure that she would take her task seriously, rather than merely regard it as just another survey.

Measures

Measures used for the experiment can be divided into five main classes. The first class of measures was tapped on the first questionnaire, with the other four appearing on the second questionnaire. The

actual questionnaires used for data collection can be found in Appendices F and G.

1. Environmental Action. A behavioral checklist, entitled *Current Activities*, was used to assess the adoption of environmental practices outlined in the newsletter. A six-point Likert-type scale was used to measure the relative frequency of current practice of the following nine activities in a subject's household[3]: 1) Recycling paper (CA 1); 2) Recycling glass (CA 2); 3) Composting organic materials (CA 3); 4) Avoiding using unnecessary electrical appliances (CA 4); 5) Using enzyme presoaks (CA 5); 6) Purchasing plastic-wrapped foods (CA 6); 7) Using less than the manufacturer-recommended amount of detergent (CA 7); 8) Measuring detergent for clothes washing (CA 8); 9) Turning off unneeded lights around the home (CA 9). Three other activities were assessed by means of a percentage rating scale -- use of low-lead gas in car (CA 10), purchase of returnable bottles (CA 11), and use of full-loads in clothes- and dishwashers (CA 13). In addition, the following activities were measured on a dichotomous, yes/no scale: placing a brick in the water closet of the toilet (CA 14), requesting a free booklet from an environmental action group on how to reduce utility bills (CA 15), joining or sending in contributions to local or national environmental action groups, respectively (CA 16 and CA 17),

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[3]Households were selected as the frame of reference for environmental action for a subject, rather than just her personal activities, since she may have delegated some of the environmentally-related activities to her children or spouse. The effect would be the same for the level of environmental activity within her household.

and switching to fluorescent lighting for at least one light fixture (CA 18). Finally, subjects were asked to list other environmentally-related activities which were being regularly practiced in their households (CA 19).

2. Eco-Action Newsletter. A six-item section entitled *The Eco-Action Newsletter* was used to assess reactions to the content of the newsletter and diffusion of newsletter content. Specifically, the following measures were employed: 1) Perception of the interest and appeal of the newsletter, measured on a five-point evaluative rating scale. 2) Perception of the helpfulness of the suggestions set forth in the newsletter, measured on a five-point evaluative rating scale. 3) Who had been reading the newsletter, including choice-points for self, spouse, children, neighbor, friend, coworkers, and other persons. 4) Who the subject had talked to about the contents of the newsletter, including choice-points for nobody, spouse, children, neighbor, friend, coworkers, and other persons. 5) What other areas the subject would like to have seen covered in the newsletter, an open-ended question. 6) Which other persons the subject would like to have the newsletter sent to, an open-ended question with the subject being requested to supply names and addresses.

3. Perception of the Prod Contact. A seven-item section entitled *Miscellaneous* was used to provide a measure of prod-condition respondents' perceptions of the prod-calls made to the subject. Six adjectives relating to the prod-call contact were rated on a four-point

Likert-type scale -- interesting, helpful, sincere, uninformative, annoying, and unfriendly. In addition, the subject was invited to write in other comments about the prod-call contact.

4. General Information. A twenty-item general information scale, entitled *Current Outlook Survey*, was used to assess various items of personal and demographic information about subjects and their households. The following variables were tapped by the *Current Outlook Survey*: the respondent's sex, marital status, age, occupation, spouse's occupation, religious affiliation, number of brothers and sisters, birth order, size of hometown, educational achievement, annual number of days spent on vacation trips, number of hours spent out-of-doors on a typical day during the month of interviewing, and number of years lived in the county and at the current address. Also measured were household income, number of cars and other vehicles in the household, number of periodicals received in the household, and responsibility for various chores in and around the home. In addition, the type of dwelling, home-ownership status, and type of heating were assessed.

5. Attitudes Toward Current Issues. A 26-item attitude scale developed from previous work by Lounsbury (1972) was used to measure two types of general attitudes -- concern for environmental degradation and concern for environmental action. This form was administered to both the subject and her spouse.

These measures were reviewed before administration by an expert in the field of survey research. The measures were pretested on 35 persons working for environmental action organizations to ascertain content validity of the current activities checklist as well as to check for general matters of clarity and redundancy of all measures. The final measures used in the Current Activities form represent those items which met two arbitrary criteria: 1) they were deemed by persons working in the area of environmental protection as important for maintaining environmental quality at the individual level; and 2) the relevant activities could be specified in fairly objective behavioral terms. Hence, an activity such as "reducing water usage" met the first, but not the second criterion. Moreover, the Current Activities, Eco-Action Newsletter, and Miscellaneous sections were pretested on 20 female middle-class subjects using a test-retest method, with a three day intertest interval. Individual reliabilities were computed on each of the items possessing an interval response scale. Test-retest correlation cut-offs of .85 were established as a criterion for retaining items in the final forms. A criterion of test-retest agreement on dichotomous items was set at 85 percent.

In addition, several other measures were compiled in the current study. The number of days elapsed from the time interviewing was initiated to the time that initial contact was established with a subject to give her the Current Activities questionnaire was recorded for each subject. Three types of unobtrusive measures were derived from the prod contacts made with subjects in conditions two and four: 1) The

length of time of the call was recorded for each prod call. 2) The subject's response to a question about which innovations were being adopted in her household was written down by the prod agent for both calls. These responses were later typed up and subjected to a Q-sort rating on a dimension of general environmental action potential by two trained raters (see Appendix H for a description of the Q-sort rating procedure). Thus, for each of the two prod calls a Q-sort rating was obtained. 3) For each of the two contacts, the prod agent made a subjective rating of the degree of interest which the subject seemed to show in discussing the suggestions set forth in the newsletter.

Scoring

The responses to the Current Activities questionnaire were scored as follows: With two exceptions, each response to an item possessing an interval scale was given a numerical value corresponding to the scale value for the response category. For items CA 4 (avoid using unnecessary electrical appliances) and CA 5 (avoid using enzyme pre-soaks), the only items for which a high initial response score would indicate a low degree of involvement in environmental action, the response value was subtracted from seven (i.e., the scale was reversed) before assigning a numberical value. The responses to dichotomous items were given scores of 1 for "yes" and 0 for "no" responses. Finally, scores for CA 19 (number of other activities) were derived by simply counting the number of discrete environmental actions listed by the subject which had appeared in the newsletter.

The measures obtained from the second questionnaire were coded and assigned numerical values by similar procedures. For a complete inventory of the coding and scoring rules see Appendices I and J.

III. RESULTS

Attrition

Attrition of the number of subjects in the experimental conditions occurred at two main stages in the course of the study. First, during the mailout of the newsletters, a number of subjects moved and the newsletters were returned to the point of mailing. In the send-to-neighbors conditions, this resulted in a diminished cell size if the target subject or either of her two adjacent neighbors moved, since the loss of any one of the three would have jeopardized any possible effect of informal discussion about the newsletters among the three neighbors. Secondly, during the data collection phase, subjects were lost from the experiment for a variety of reasons. By way of example, during this phase some subjects moved, were hospitalized, died, could not be contacted, refused to participate in the follow-up survey, and did not mail in survey forms as promised. Furthermore, refusals occurred at the two main sub-stages of data collection -- at the initial contact, when the current activities questionnaire was administered, and at the second contact (or, simply after the first contact in cases where the subject could not be contacted again), when the second questionnaire was retrieved. At the first contact, some subjects refused for no stated reason while other subjects gave excuses

such as the following: "I don't have the time," "I can't be bothered," "My husband won't let me," "My son just broke his arm so I can't," and "I don't want to be involved." Also, several husbands answered the door at the first contact and flatly refused to allow their wives to respond to the survey. Additionally, at the second contact, subjects refused to fill out all or certain parts of the questionnaire because they were offended by the questions about income and/or education, and because they were "too busy to fill out all the forms." Several subjects were repeatedly not home for a second contact. In every case where a maximum of four additional home visits failed to establish contact with a subject, or where the subject would otherwise have refused to fill out the forms, mail-in forms were provided, replete with stamped, return-addressed envelopes. Table 3 displays the loss of subjects by category for each of the five conditions. Using a chi-square test for differences in probability (Conover, 1971), it was found that there were no significant differences between groups for any of the first four categories in part A of Table 3.[4] However, there was a significant ($p < .05$) difference between conditions in total number of subjects from whom the first questionnaire was not obtained.

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[4]Because a chi-square test for overall difference between all groups in each of the four cases would have required 50 percent of the expected cell frequencies to be less than five (see Cochran, 1954, for an explanation of the inappropriateness of the chi-square statistic in this situation), three separate tests were made using the following cell combinations for each of the four cases: 1 plus 2 versus 3 plus 4; 2 plus 4 versus 1 plus 3; and 1 versus 4. Thus, altogether for the first four categories in part A of Table 3, a total of 12 chi-square tests were performed.

TABLE 3. Attrition of Subjects

Source of Attrition	Condition				
	1 News-letter Only	2 Prod/No-Send-to-Neighbors	3 No-Prod/ Send-to-Neighbors	4 Prod/ Send-to-Neighbors	5 Control
A. Prior to and including the initial data collection contact: Number of subjects from whom no information was collected on either questionnaire.					
1. Subject moved during newsletter mail-out	3	1	5	3	-
2. Subject completely refused follow-up survey	3	2	5	3	4
3. Subject was contacted initially and left both questionnaires to mail in but did not comply	0	0	2	0	2
4. Unable to make initial contact; subject did not return mailed questionnaires	5	0	2	0	4
Total number of subjects from whom environmental action information was not obtained	11	3	14	6	10

TABLE 3. (Continued)

Source of Attrition	Condition				
	1 Newsletter Only	2 Prod/No-Send-to-Neighbors	3 No-Prod/Send-to-Neighbors	4 Prod/Send-to-Neighbors	5 Control
B. After initial contact: Number of subjects from whom first questionnaire was obtained, but part or all of second questionnaire was not retrieved.					
General Information	4	5	3	3	8
Current Outlook Survey (respondent's form)	5	3	3	3	8
Current Outlook Survey (spouse's form)	10	11	10	7	13
Total number of subjects with first but not the second questionnaire filled out	19	19	16	13	29

Specifically, significantly ($p < .05$) more subjects were retained in the prod conditions than the no-prod conditions.

Comparability of Experimental Conditions

Although subjects were randomly assigned to conditions, it was decided to investigate possible differences between conditions on potentially relevant variables which might have influenced the degree of participation in environmental action. Eleven of these variables and their mean values are displayed in Table 4, which also shows the results of one-way univariate analyses of variance (Winer, 1962) used to test for differences between conditions. In addition, the percentages for three other potentially relevant variables characterized by dichotomous score values are shown in Table 5, which also shows the results of chi-square tests which were used to test for differences between conditions.

As can be seen from Tables 4 and 5, the only variable showing a significant difference among the five groups was the number of days elapsed between the start of data collection and the time a subject was contacted for an initial interview. A Newman-Keuls *a posteriori* test (Winer, 1962) revealed that only groups three and five differed significantly ($p < .05$) from each other on this variable. If innovation adoption were to vary systematically as a function of time during the data collection period, this difference might bias the tests for main effects; however, the days-elapsed variable did not correlate

TABLE 4. Means and *F*-ratios for Eleven Potentially Relevant Variables

Variable	Condition					*F*	df
	1 Newsletter Only	2 Prod/No-Send-to-Neighbors	3 No-Prod/Send-to-Neighbors	4 Prod/Send-to-Neighbors	5 Control		
1. Age of subject	43.68	47.44	47.39	40.48	42.59	.97	4, 110
2. Subject's number of children	2.22	2.35	2.27	2.00	2.07	.21	4, 113
3. Subject's occupational prestige status	59.20	61.17	55.00	56.45	55.50	1.22	4, 36
4. Subject's level of educational achievement	3.65	3.85	3.71	3.73	3.81	.11	4, 112
5. Number of years subject has lived at current address	4.89	4.00	4.78	4.77	4.85	1.40	4, 112
6. Number of years subject has lived in Ingham County	5.70	5.00	5.22	5.04	5.81	1.68	4, 108
7. Spouse's occupational prestige status	50.14	56.16	44.91	56.58	50.87	.66	4, 82
8. Household income level	2.50	2.75	2.94	2.69	3.44	1.32	4, 96

TABLE 4. (Continued)

Variable	Condition					*F*	df
	1 Newsletter Only	2 Prod/No-Send-to-Neighbors	3 No-Prod/Send-to-Neighbors	4 Prod/Send-to-Neighbors	5 Control		
9. Number of cars in household	1.85	1.50	1.83	1.58	1.78	1.01	4, 107
10. Number of other vehicles in household	.52	.20	.89	.31	.44	1.29	4, 107
11. Number of days elapsed between start of data collection and initial contact	25.25	28.19	23.43	23.81	29.17	3.16*	4, 136

* $p < .05$

Note.--The mean values for variables 2, 3, 4, 5, 6, and 8 refer to coded values. For a description of the actual categories which correspond to these values, see Appendix G.

TABLE 5. Percentages and Chi-Squares for Three Potentially Relevant Dichotomous Variables

Variable	Condition					Chi-Square	df
	1 Newsletter Only	2 Prod/No Send-to-Neighbors	3 No-Prod/ Send-to-Neighbors	4 Prod/ Send-to-Neighbors	5 Control		
1. Contact for initial interview made by prod agent	22 (n = 23)	20 (n = 30)	25 (n = 20)	21 (n = 29)	27 (n = 33)	.74	4
2. Subject employed full- or part-time	50 (n = 20)	24 (n = 25)	30 (n = 17)	42 (n = 26)	33 (n = 27)	4.17	4
3. Spouse employed full- or part-time	88 (n = 16)	90 (n = 21)	100 (n = 12)	83 (n = 23)	100 (n = 23)	4.35	4

Note.--n = number of subjects from whom information was obtained on the variable. Critical value for chi-square with four degrees of freedom, $p < .05 = 9.49$.

significantly with any of the environmental action measures. In fact, the largest correlation between an environmental action measure and the number of days elapsed until contact for the initial interview was only .12.

It seems, therefore, that the lack of equivalence of the experimental conditions on the number of days elapsed until initial interviewing did not bias the test for main treatment effects discussed below. On the whole the interviewing counterbalancing and random assignment methods were successful in equating the five conditions on potentially relevant variables.

Environmental Action Results

From the original 18 measures of environmental action, 14 were retained for data analysis purposes.[5] The means and standard deviations of each of the 14 variables were computed for each condition, with the results being displayed below in Table 6 (for a listing of the overall

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[5]A final critique of the environmental action items was made prior to data analysis, after interviewing was complete and the subjects' informal feedback on the questionnaires had been received. Subsequently, CA 9 (turning off unneeded lights around the home) was dropped from the analysis after it was decided that its wording lacked specific behavioral referents. Also, CA 15 (requesting a free booklet on how to reduce utility bills), and CA 16 and CA 17 (sending in contributions to local and national environmental action groups, respectively) were dropped because they did not signify direct household-based environmental actions. For example, writing for a free booklet does not necessarily reduce environmental pollution; in fact, it may only increase solid waste pollution. Also, sending a contribution to an environmental action group does not represent a personal involvement in environmental action.

TABLE 6. Means, Standard Deviations and Number of Respondents for Environmental Action Variables by Condition

Variable		Condition					Combined Groups (1-5)
		1 Newsletter Only	2 Prod/No Send-to-Neighbors	3 No-Prod/ Send-to-Neighbors	4 Prod/ Send-to-Neighbors	5 Control	
CA 1	Mean	2.79	3.68	2.45	2.65	2.20	2.76
Recycling glass	SD	1.78	2.18	1.75	1.82	1.82	1.96
	n	24	31	20	29	35	139
CA 2	Mean	2.35	3.35	2.95	3.14	2.26	2.81
Recycling paper	SD	1.76	2.12	2.15	2.00	1.81	2.02
	n	23	31	21	29	35	139
CA 3	Mean	2.45	3.19	2.48	2.57	2.31	2.62
Composting	SD	1.97	2.05	1.79	1.97	1.83	1.96
	n	22	32	21	27	35	137
CA 4	Mean	3.58	3.77	3.10	3.79	3.32	3.53
Avoid using unnecessary	SD	1.85	1.50	1.95	1.69	1.79	1.76
electrical appliances	*n*	24	31	21	29	35	140
CA 5	Mean	4.58	4.72	5.05	4.66	5.43	4.91
Avoid using enzyme pre-	SD	1.87	1.79	1.53	1.88	1.10	1.68
soaks	*n*	24	32	20	29	35	140

TABLE 6. (Continued)

Variable		Condition					Combined Groups (1-5)
		1 Newsletter Only	2 Prod/No Send-to-Neighbors	3 No-Prod/ Send-to-Neighbors	4 Prod/ Send-to-Neighbors	5 Control	
CA 6	Mean	3.21	3.91	2.33	4.04	3.37	3.44
Avoid plastic-wrapped	SD	1.80	1.63	1.21	1.32	1.66	1.65
food products	*n*	24	32	21	28	35	140
CA 7	Mean	3.42	5.16	4.45	5.00	4.12	4.46
Using less detergent than	SD	2.00	1.48	1.94	1.36	1.81	1.82
manufacturer recommends	*n*	24	31	20	29	34	138
CA 8	Mean	5.25	5.22	5.10	5.38	5.11	5.21
Using a measuring device	SD	1.71	1.65	1.60	1.52	1.88	1.69
for detergents	*n*	24	32	21	29	35	141
CA 10	Mean	2.13	2.23	2.81	1.46	1.77	2.02
Using low-lead gas in	SD	3.66	3.51	3.96	2.71	3.56	3.49
car	*n*	23	31	16	26	31	127
CA 11	Mean	5.22	5.12	4.70	5.07	4.39	4.89
Buying returnable bot-	SD	4.05	3.89	3.49	3.28	3.53	3.67
tles	*n*	23	32	20	28	33	136

TABLE 6. (Continued)

Variable		Condition					Combined Groups (1-5)
		1 Newsletter Only	2 Prod/No Send-to-Neighbors	3 No-Prod/ Send-to-Neighbors	4 Prod/ Send-to-Neighbors	5 Control	
CA 13	Mean	8.54	8.90	8.56	9.00	7.91	8.57
Running only full loads	SD	2.08	1.97	2.52	1.60	2.54	2.19
in washers and dryers	*n*	24	31	19	28	33	135
CA 14	Mean	.17	.23	.11	.07	.06	.12
Put a brick in toilet	SD	.38	.42	.31	.25	.23	.33
	n	23	31	18	29	35	136
CA 18	Mean	.37	.35	.25	.31	.20	.30
Switched to fluorescent	SD	.48	.48	.43	.46	.40	.46
lighting	*n*	24	21	20	29	35	139
CA 19	Mean	.12	.74	.20	.45	.34	.40
Number of other activi-	SD	.33	1.87	.51	.85	.83	1.10
ties	*n*	24	31	20	29	35	139

frequencies by response category for each of the 14 variables, see Appendix K).

The initial step prior to actual analysis of the main experimental effects was to discover if the 14 environmental action measures were statistically independent. The rationale here was that the type of statistical analysis employed would depend on whether or not the measures were independent. To provide an empirical answer to this question, Pearson product-moment correlation coefficients (Guilford and Fruchter, 1973) were computed for all possible pairs of environmental action items. The median correlation between items was only .05. Furthermore, using a chi-square test for goodness of fit (Conover, 1971), the hypothesis that the distribution of correlations was normally distributed with a mean of .00 was not rejected. Therefore, for present purposes it was concluded that the environmental action measures were statistically independent.

The three main hypotheses of the study were examined by use of one-tailed statistical tests. To test for the effect of the newsletter on the environmental action variables with an interval response scale, a t-test for comparing a control group with an experimental group (Winer, 1962, pp. 89-92, 264) was used for each of the environmental action variables. To test for effects of the prod and send-to-neighbors treatment variables on the environmental action items with an interval rating scale, analysis of variance techniques were used. Separate Bartlett tests (Guenther, 1964) were first computed to test for homogeneity of variance among the five conditions. None of the

tests were significant ($p < .05$) except in the case of CA 19 (number of other activities), where the results indicate a significant ($p < .01$) heterogeneity of variance between conditions. Given that the variances were significantly heterogeneous in only one case, it was decided that the computations of analyses of variance were appropriate. The results of these analyses are displayed in Table 7. In addition, the results of the t-tests are summarized in Table 8.

For the dichotomous environmental action variables -- CA 14 (put a brick in the toilet) and CA 18 (switched to fluorescent lighting) -- a chi-square test for differences in probability was computed to test the null hypothesis of no difference between: 1) newsletter-only and control conditions; 2) prod and no-prod conditions; and 3) send- and no-send-to-neighbors conditions. In the latter two cases, in each test of the independent variable, the other independent variable was collapsed across its two levels. Thus, for example, the test of the prod conditions versus the no-prod conditions contrasted the combination of groups two and four against groups one and three. The results of these tests are shown in Table 9.

Turning to the main effects, and using a criterion of significance of $p < .05$, it can be seen from Tables 7 through 9 that:

1. There was one significant test for the newsletter effect.
2. There were no significant tests for the send-to-neighbors effect.
3. There were four significant tests for the prod effect.

TABLE 7. Summary of Analyses of Variance for Environmental Action Variables

Variable	Source of Variation	df	Mean Square	*F*
CA 1	Prod	1	7.31	1.94
Recycling paper	Send	1	14.26	3.79[a]
	Prod x Send	1	1.07	.28
	Within cell	135	3.77	
CA 2	Prod	1	11.30	2.82*
Recycling glass	Send	1	1.91	.47
	Prod x Send	1	5.20	1.28
	Within cell	135	4.05	
CA 3	Prod	1	6.98	1.77
Composting	Send	1	2.26	.57
	Prod x Send	1	6.10	1.55
	Within cell	133	3.93	
CA 4	Prod	1	1.68	.51
Avoid using unnecessary	Send	1	1.24	.38
electrical appliances	Prod x Send	1	4.48	1.37
	Within cell	136	3.28	
CA 5	Prod	1	.32	.10
Avoid using enzyme pre-	Send	1	.58	.19
soaks	Prod x Send	1	1.60	.53
	Within cell	136	3.03	
CA 6	Prod	1	36.70	14.38**
Avoid plastic-wrapped food	Send	1	2.47	.97
products	Prod x Send	1	3.15	1.23
	Within cell	136	2.55	
CA 7	Prod	1	37.29	10.89**
Using less detergent than	Send	1	3.20	.94
the manufacturer recom-	Prod x Send	1	4.35	1.27
mends	Within cell	134	3.42	
CA 8	Prod	1	.00	.00
Using a measuring device	Send	1	.10	.04
for detergents	Prod x Send	1	1.77	.63
	Within cell	137	2.82	

TABLE 7. (Continued)

Variable	Source of Variation	df	Mean Square	*F*
CA 10				
Using low-lead gas in car	Prod	1	8.03	.67
	Send	1	10.19	.85
	Prod x Send	1	1.81	.15
	Within cell	123	12.03	
CA 11				
Buying returnable bottles	Prod	1	1.76	.12
	Send	1	3.30	.23
	Prod x Send	1	.56	.04
	Within cell	132	14.17	
CA 13				
Running only full loads in washers and dryers	Prod	1	8.32	1.05
	Send	1	8.39	1.06
	Prod x Send	1	14.16	1.79
	Within cell	131	7.89	
CA 19				
Number of other activities	Prod	1	4.89	4.09*
	Send	1	.43	.36
	Prod x Send	1	.73	.61
	Within cell	135	1.19	

Explanation: The analysis of variance computed for each of the variables was based on a two-by-two analysis of variance with the within cell variance of the additional control group pooled to yield a better estimate of overall within cell variance (Winer, 1962, pp. 263-267).

Prod indicates the main effect for the prod variable

Send indicates the main effect for the send-to-neighbors variable.

Prod x Send indicates the prod/send-to-neighbors interaction effect.

[a]Indicates that the mean of the no-send-to-neighbors condition was significantly ($p < .05$) greater than the mean of the send-to-neighbors conditions.

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

TABLE 8. Summary of t-tests for Environmental Action Variables

Variable	t	df
CA 1 Recycling paper	1.22	57
CA 2 Recycling glass	.00	56
CA 3 Composting	.38	54
CA 4 Avoid using unnecessary electrical appliances	.97	56
CA 5 Avoid using enzyme pre-soaks	2.27[a]	57
CA 6 Avoid plastic-wrapped food products	.78	57
CA 7 Using less detergent than manufacturer recommends	1.41	56
CA 8 Using a measuring device for detergents	.78	57
CA 10 Using low-lead gas in car	.85	54
CA 11 Buying returnable bottles	.80	54
CA 13 Running only full loads in washers and dryers	1.12	55
CA 19 Number of other activities	3.10[b]	57

[a]Indicates that the mean of the control group was significantly ($p < .05$) greater than the mean of the newsletter-only group.

[b]Indicates that the mean of the control group was significantly ($p < .01$) greater than the mean of the newsletter-only group.

TABLE 9. Summary of Chi-Square Tests for Environmental Action Variables

Variable	Comparison	Chi-Square	df
CA 14 Put a brick in toilet	Newsletter-only/ Control	2.30	1
CA 18 Switched to fluorescent lighting	Newsletter-only/ Control	3.26*	1
CA 14 Put a brick in toilet	Prod/No-Prod	.00	1
CA 18 Switched to fluorescent lighting	Prod/No-Prod	.01	1
CA 14 Put a brick in toilet	Send-to-neighbors/ No-send-to-neighbors	2.86[a]	1
CA 18 Switched to fluorescent lighting	Send-to-neighbors/ No-send-to-neighbors	.91	1

* $p < .05$

[a]Indicates that the percentage for no-send-to-neighbors conditions was higher than for send-to-neighbors conditions.

Using tables provided by Sakoda and his colleagues (1954), for the test of significance for a series of statistical tests, only the prod variable is found to show a significant ($p < .01$) net effect over the 14 environmental action measures.[6] On the whole, prod condition subjects participated more extensively in environmental action than no-prod condition subjects.

Prod Correlates of Environmental Action

A separate cluster analysis was computed using the questionnaire and unobtrusive measures relating to the prod calls to discover which variables clustered with environmental action measures. First, using data from groups two and four (i.e., the prod conditions), an initial cluster analysis was performed on the six measures of perception of the prod call process. All but one of the items -- perception of the contact as uninformative -- were found to cluster together. This cluster appears to be reflecting a general evaluative (e.g., "good"/"bad") perception of the prod contact. A standardized factor score was computed on this cluster for each subject using equal weights for items and summing the simple z-scores (Ghiselli, 1964) for the five items. This factor score, labelled evaluative prod perception, and

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[6]As an additional evaluation of net effects, a sign test (Siegel, 1956) was used for the three main treatments to assess the direction of mean differences between conditions on each of the 14 environmental action variables. Again, the prod effect was significant ($p < .01$), whereas the newsletter and send-to-neighbors effects were not found to be significant, thus confirming the results found above using the Sakoda tables.

the item on which the prod contact was rated as to degree of uninformativeness were retained for the larger cluster analysis of prod correlates. For the full cluster analysis of prod-related variables, the following items were used: the 14 environmental action variables, the Q-sort and subjective ratings for each call, plus the relative change in each type of rating from the first to the second call, and the length of time for each prod contact. The results of this cluster analysis are depicted in Table 10.

The only environmental action measures that are found in the cluster with the prod variable are the items referring to recycling of glass and paper. One way of looking at this cluster is to regard increased recycling of paper and glass as occurring in a situation where not only does the subject rate the total contact favorably, but also the prod agent and independent raters rate the first contact favorably, with the prod agent's subjective rating of the degree of interest exhibited by the subject in discussing environmental action suggestions being higher for the first than the second contact. It should be further noted that the length of time for either call did not emerge in this cluster.

Because of the independence of the environmental action items it is not surprising that only one cluster emerged in the above analysis, and that it contained only two environmental action items. Of interest also in this context were the specific correlations between the other three environmental action items which individually differentiated prod and no-prod conditions at a probability level of less

TABLE 10. Summary of Results for the Cluster Analysis of Prod Correlates of Environmental Action

Prod Correlates of Environmental Action Cluster	
Item	Cluster Loading
Prod agent assigns higher ratings on the degree of interest shown by the subject in discussing environmental action suggestions during the first prod call.	.86
Prod agent rates first prod call higher than second prod call on degree of interest shown by the subject in discussing environmental action suggestions.	.75
Independent raters assign higher ratings on degree of environmental action potential evinced by the subject during the first prod call.	.72
The subject reports relatively greater frequency of recycling glass.	.65
Independent raters assign relatively higher ratings on degree of environmental action potential evinced by subject during the first prod call than the second prod call.	.63
The subject reports relatively greater frequency of recycling paper.	.52
The subject's evaluative perception of the overall prod contact is higher.	.39

Note.--The Spearman-Brown composite reliability (Tryon and Bailey, 1970) for this cluster is .85.

than .05 (i.e., CA 6, CA 7, CA 19) and the prod variables. These correlations are shown in Table 11.

As can be seen from Table 11, CA 7 (using less detergent than the manufacturer recommends) is not significantly correlated with any of the prod variables. CA 19 (number of other environmental activities listed) is significantly related to the amount of time spent on the first and second prod calls. Also, CA 6 (avoid plastic wrapped food products) correlates positively and significantly with: 1) the subject's perception of the prod contact as being informative; 2) the Q-sort rating of the first call on potential for environmental action; and 3) the prod agent's rating of the degree of interest of the subject in discussing environmental action.

An Examination of the Effectiveness of the Send-to-Neighbors Manipulation

The goal of the send-to-neighbors conditions was to induce subjects to talk about the contents of the newsletter with their neighbors and thereby build up group support for environmental action. The analyses of variance presented earlier indicate that the treatment was not at all effective in meeting the latter objective. An analysis of one of the diffusion measures in the second questionnaire sheds some light on this lack of effectiveness.

The basic assumption of the send-to-neighbors conditions was that more subjects in these conditions would talk to their neighbors about the newsletter than in the no-send-to-neighbors conditions. The

TABLE 11. Correlations Between Selected Environmental Action Variables and Prod Variables

Variable	CA 6 Avoid plastic-wrapped food products	CA 7 Using less detergent than manufacturer recommends	CA 19 Number of other activities
Subject's perception of the overall prod contact as uninformative	-.44**	-.26	-.26
Prod agent's evaluation of subject's degree of interest shown in first prod call	.29*	.18	.16
Q-sort rating of subject's environmental action potential for first prod call	.42**	.22	.17
Time spent on first prod call	.03	.16	.31*
Prod agent's evaluation of subject's degree of interest shown in second prod call	.04	.23	.17
Q-sort rating of subject's environmental action potential for second prod call	.01	.08	.02
Time spent on second prod call	-.05	-.01	.40**
Change in prod agent's rating from first to second prod call	.14	.02	.00
Change in Q-sort rating from first to second prod call	.01	.01	-.03
Subject's general evaluative perception of the overall prod contact	.04	.01	.01

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

most direct evidence bearing on this assumption comes from an examination of the number of subjects in each condition who circled "neighbor" (or "neighbors") in the item relating to whom the subject had talked with about the newsletter. These percentages are shown in Table 12. As can be seen, the percentage of subjects who talked with their neighbors about the newsletters is lowest, not highest, in the two send-to-neighbors conditions. A chi-square test revealed that the relative difference in favor of the no-send-to-neighbors conditions is not significant. It can be seen, then, that the original purpose of the send-to-neighbors conditions -- inducing subjects to communicate more with their neighbors about the newsletters -- was not achieved.

Attitudinal, Demographic, and Diffusion Correlates of Environmental Action

The following variables were selected for an empirical cluster analysis to ascertain the relationship of various attitudinal, demographic and diffusion variables supplied by the second questionnaire to the environmental action measures: the 14 environmental action variables; the three diffusion variables; a summated standard score of the perception of the newsletter as interesting and helpful; the respondent's age, number of children, educational achievement level, number of hours spent out-of-doors in a typical day during the month of interviewing, number of days spent on vacation in the previous year, and length of time lived at the current address and in Ingham County; the respondent's and her spouse's employment status, occupational prestige status and attitudes

TABLE 12. Percentage of Subjects Who Reported Talking With Their Neighbors About the Contents of the Newsletter

Condition	*n*	Percentage
1. Newsletter only	20	25
2. Prod/No-Send-to-Neighbors	26	31
3. No-Prod/Send-to-Neighbors	18	22
4. Prod/Send-to-Neighbors	26	12

Note.--*n* indicates the number of subjects who completed item 1 on page 1 of the second questionnaire.

toward environmental quality and environmental action; the number of cars and other vehicles in the household, and household annual income level and number of subscriptions.

The data for this analysis were obtained from the 121 subjects who filled out the first questionnaire (up to the environmental attitudes sections). The other variables generated by the study were not used in the cluster analysis for either of two reasons: 1) their variances were very low or near zero (e.g., marital status was not included because 96 percent of the respondents were married); or 2) because they were not considered to be directly relevant to the current investigation (e.g., respondent's birth order). With regard to the latter point, an effort was made to minimize the possibility of chance correlations entering into the cluster analysis by keeping the subjects-to-variables ratio as large as possible. In this case the ratio was approximately[7] 121 subjects to 40 variables, or a ratio of about three-to-one.

The results of this cluster analysis are displayed in Table 13. Two relatively independent clusters emerged. The correlations between the two oblique cluster domains was .12. The first cluster contains several measures of the subject's personal sentiment -- toward the newsletter and toward environmental quality and action -- and two measures of the diffusion of the contents of the newsletter. Only one environmental action item, CA 7 (using less detergent than the manufacturer

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[7]The term approximately is used here because some of the subjects did not fill out some of the items even though they may have responded to, say, 98 percent of the questionnaire items.

TABLE 13. Summary of Results for the Cluster Analysis of Attitudinal, Demographic, and Diffusion Correlates of Environmental Action

Item	Cluster Loading
CLUSTER 1	
More favorable perception of the newsletter as interesting and helpful.	.85
More favorable attitude toward concern for environmental quality.	.56
More favorable attitude toward concern for environmental action.	.55
Greater number of types of person talked to about the contents of the newsletter.	.55
Greater number of types of other persons who read the subject's copy of the newsletter.	.54
More frequently uses less laundry detergent than the manufacturer recommends.	.46
CLUSTER 2	
Has lived longer at the current address.	.67
More frequently recycles paper.	.56
Spent more days on vacation trips last year.	.53
Being older.	.48
More frequently recycles glass.	.44
Has lived longer in Ingham County.	.36

Note.--The Spearman-Brown composite reliability (Tryon and Bailey, 1970) is .75 for Cluster 1 and .68 for Cluster 2.

recommends), clustered with the above items. The second cluster contained two positively loaded environmental action items, CA 1 (recycling glass) and CA 2 (recycling paper), along with four other variables having to do with time -- the respondent's age, number of years lived at the current address and in Ingham County, and number of days spent on vacation trips last year.

Conspicuously absent from these two clusters are the majority of the 14 environmental action and 16 demographic variables used in the analysis. Considering them separately, it was found that of a total of 224 different correlations between a demographic and an environmental action variable, only four were significant at the p less than .01 level. Even if one were to assume the correlations to be mutually independent (which they are most certainly not), such a finding is not significant (cf., Sakoda *et al.*, 1954).

IV. DISCUSSION

In the introduction it was pointed out that different results have been obtained with the use of the written word in promoting innovation adoption. The newsletter-only condition in this study provided an opportunity to explore its utility in creating environmental action. The results of this experiment provide no support for the hypothesis that an information dissemination approach in the form of an eco-action newsletter is more effective than doing nothing at all to involve middle-class citizens in environmental action. None of the comparisons of the newsletter-only versus control condition favored the newsletter treatment; in fact, an examination of the individual tests displayed in Tables 8 and 9 reveals that the no-newsletter control group was significantly ($p < .05$) superior to the newsletter-only group on mean frequency of avoiding using enzyme pre-soaks (CA 5) and mean number of other environmental activities practiced (CA 19).

There are several possible reasons for the failure of the newsletter to stimulate environmental action. First, the subjects might not have read the newsletter at all; or they may not have read it carefully. However, with regard to the former point, the fact that 100 percent of the subjects in the newsletter-only condition indicated that they had read the newsletter militates against this possibility. On the other

hand, the subjects receiving the newsletter may have read it and maybe even absorbed the information but did not act on it. This line of thought cannot be directly tested in the current study; however, it is in agreement with previous research on innovation diffusion (e.g., Freedman and Takeshita, 1969; Fairweather *et al.*, 1973). Along these lines it is also possible that since there is so much information in the popular media about the environment, the subjects may have simply tuned out the suggestions as "just another presentation about environmental problems," or as one subject put it, "just another headache in our world today."

Alternatively, it might be thought that the ineffectiveness of the newsletter was due to some sort of "ceiling" effect whereby all the subjects were already participating in the relevant environmental activities to such a high degree that there was no room for improvement. However, an examination of Appendix K shows that on only two environmental action items -- CA 5 (avoid using enzyme pre-soaks) and CA 8 (using a measuring device for detergents) -- did the majority of the subjects use the highest response category to indicate their level of activity. Moreover, most responses for most items were in the lower end of the response categories. Also, there was enough variability in response for each of the environmental action items (see Table 6 and Appendix K) to suggest that none of the activities were altogether too difficult or otherwise beyond the capacity of the subjects. It seems more reasonable to view the ineffectiveness of the newsletter as a function of the treatment itself rather than the innovations which it advocated.

In this regard, it is possible that the newsletter was of such an abstract nature that although the subjects who received it read it, they could not understand it or relate its suggestions to appropriate personal environmental actions. However, the newsletter was reviewed and judged to be excellent in terms of clarity, relevance and thoroughness by a half-dozen experts in the field of environmental action who had full-time jobs which required specifically communicating environmental issues to the public through a regular newspaper or newsletter format. Additionally, the suggestions set forth in the newsletter were, wherever possible, tailored to the Lansing community in general and middle-class citizens in particular. Also, although clarity of the newsletter's contents was not measured, the majority of the subjects in the newsletter-only condition (and in all groups combined) perceived the newsletter as both interesting and helpful.

Therefore, it is concluded that the ineffectiveness of the newsletter-only treatment in the current experiment is primarily due to the lack of potency of the printed information medium when used by itself, rather than to factors associated with the types of environmental action advocated by the newsletter, the quality of the newsletter, or the nature of the subjects who participated in the study. This type of finding is probably not restricted to the environmental action sector. Other programs which seek to change larger, more complex constellations of behaviors in the general public such as in the areas of family planning, rural agriculture, health care, and consumer protections -- where the target behaviors to be adopted might involve such behaviors and practices as

the birth rate of a married couple, new farming methods, new health care techniques, and alternative individual consumer practices respectively -- also might find newsletters to be ineffective in creating behavior change.

Another important problem to which this researcher was addressed is the effectiveness of personal contacts and change advocacy in involving private citizens in environmental action. Before turning to the main results, some mention must be made of the differential attrition of subjects between conditions. Although there was less attrition of subjects in the prod conditions, it is doubtful that this biases the results of the prod versus no-prod tests. In the first place, it was the opinion of both interviewers that those persons who discussed their refusals to participate in the follow-up survey usually showed little or no interest in the newsletter or in environmental action. Another way of looking at the attrition due to refusals is to regard the refusals as a relevant dependent variable. Thus, it may be that fewer prod condition subjects refused to participate in the survey because of the prod contact -- that is, the personal contact may have facilitated cooperation in the follow-up survey.

With reference to attrition resulting from sources other than refusals, in a sense the relatively lower attrition rate for subjects in prod conditions may also be attributed to the prod contact itself. Specifically, the prod calls were a way of keeping abreast of: a subject's plans to move, when she would be on vacation, and when she was home during the day or evening. Thus, as a monitoring device, the prod calls provided

knowledge which was useful in planning for the initial contact with a subject, and may have thereby reduced the number of lost subjects in prod groups.

In either of the above cases such effects would not bias the prod-no-prod comparisons in favor of the prod conditions. To the contrary, in the event that subjects who refused or moved were apt to be less involved in environmental action, there would have been a treatment bias due to attrition in favor of the no-prod conditions.

The overall results of this experiment indicate that the prod condition subjects were found to be more extensively engaged in environmental action than the no-prod conditions. In this context it should be noted that the prod treatment is really a newsletter-plus-prod treatment, since all the prod condition subjects received the newsletter in addition to the prod calls. Thus, it can be tentatively concluded that in the situation of the current investigation a personal contact in conjunction with an information dissemination device using a printed format is relatively effective in involving middle-class citizens in environmental action.

The question arises as to what are the important characteristics of the personal contact which make it effective in changing behavior. On a speculative level one might guess that any of the following reasons might help to explain the efficacy of the prod contact: the subject might have felt reinforced for tentative adoption efforts; or she may have felt guilty about not doing anything and therefore acted to alleviate her guilt; or the contact might simply have served to remind her to read the

newsletters and, consequently, to act on its suggestions. On a more empirical basis the results shown in Tables 11 and 12 present some information which bears on this question. Recycling glass, a measure on which prod condition subjects were found to be significantly more actively engaged than subjects not receiving prod calls, and recycling paper were found to cluster with several variables which deal with a positive evaluation of the prod contact, as viewed by the researcher and the subject on certain criteria. More specifically, when the subject viewed the total prod contact as a combination of interesting, helpful, sincere, friendly, and unannoying, the subject was rated high on environmental action potential and degree of interest shown in talking about environmental action during the first prod call by members of the research team. Furthermore, this cluster indicates that the key to the prod contact process may lie in the first prod call. Thus, this cluster contained items which depicted relatively higher favorable evaluative ratings by members of the research team for the first prod call than the second prod call.

It should be emphasized, however, that the above-mentioned cluster did not contain the other three environmental action variables which significantly differentiated between prod and no-prod conditions in favor of the prod conditions -- CA 6, CA 7, and CA 19 (although they did load positively on the cluster at .32, .12, and .10, respectively). Considering these items separately, it was found that the environmental action measure representing avoiding buying plastic-wrapped food products

(CA 6) correlated positively and significantly with the Q-sort and prod agent's subjective ratings for the first contact and with the subject's ratings of the prod contacts as informative. In addition, the measure of the number of other environmental items listed as practiced on a regular basis (CA 19) was significantly, positively correlated with the amount of time spent on the first and second calls. One explanation for such a finding is that longer prod calls permitted more of an opportunity to discuss other activities than the target ones which the prod agent brought up in the first part of the conversation. Thus, some discussion of an environmental action item appears to be helpful in making it susceptible to influence by a personal contact.

To summarize the above findings, it appears that for a prod call to be effective in inducing an individual to participate more extensively in an environmentally-related action or set of actions, the action should be discussed; the subject should regard the contact favorably as indicated by a general evaluative rating scale; and the subject's remarks during the contact should be viewed favorably by the researcher or prod agent on the dimension of indicated environmental action potential or degree of interest in discussing environmental action.

Future research should attempt to gain more precise ratings by the researcher and the subject of the prod contacts with respect to these and other activities, to see if these findings are replicable and to investigate other attributes of the personal contacts in prod calls. It would also be useful to manipulate experimentally, say, the degree of friendliness and the degree of task orientation of the prod agent to see

which component is contributing more to the favorable evaluation by the subject of the prod contact. The present study found only that a prod contact which was designed to be a highly specific, task-oriented, and friendly conversation with a subject was relatively effective in creating increased participation in environmental action.

Another goal of the present research was to examine the effectiveness of the send-to-neighbors treatment in promoting environmental action. The send-to-neighbors treatment was a failure both in terms of effect and intended manipulation. Regarding the latter, more of the subjects in the no-send-to-neighbors conditions reported that they talked to their neighbors about the newsletter than did subjects in the send-to-neighbors conditions. Thus, it is not surprising that the send-to-neighbors effect was not significantly more effective for any of the environmental action measures. This does not mean that interpersonal communication about the newsletter was uncorrelated with participation in environmental activities. The variable indicating the number of types of persons with whom the subject talked about the contents of the newsletter was significantly, positively correlated with half of the environmental action variables (see Appendix L). On the other hand, the direction of causality for such a relationship is unclear. For example, it is not known if people who participated more extensively in environmental action subsequently communicated more about the newsletter with friends, neighbors, and coworkers, or if the reverse process occurred (i.e., interpersonal communication about the newsletter preceded environmental action).

Even if increased diffusion activity leads to increased environmental action, the problem still remains of devising a technique which produces increased interpersonal communication about environmental action practices. One reason why the send-to-neighbors treatment failed to do so might be because the experiment was conducted mainly during the late Fall and Winter months from October through February, when there is much less informal neighbor-to-neighbor interaction than in, say, June, July, or August. Accordingly, future experimentation in this area might try to induce the send-to-neighbors effect by conducting the project during the Spring, Summer, or early Fall; however, in the Summer months many people are likely to leave home for vacation trips. Another approach to stimulating inter-neighbor communication about the newsletter on environmental action techniques would be to use the personal contacts as a forum for advocating such communication. That is, a prod agent might focus on the subject's communication with her neighbors about the newsletter.

It should be noted, however, that the above considerations do not take into account the equally likely alternative that regardless of the treatment used, environmental actions are just not a relevant topic for most persons' conversations with their neighbors. Thus, for the majority of middle class citizens it may not be possible to plug the current type of innovation adoption into informal neighborhood communication and discussion networks.

Another concern of this study was to explore the attitudinal, demographic, and diffusion correlates of environmental action. A

cluster analysis of these variables yielded two relatively independent dimensions. The first cluster is composed of items which are either explicitly or implicitly verbal in nature. Thus, in this cluster can be found: the environmental activity more frequently using less detergent than the manufacturer recommends (which requires reading the detergent label to observe the recommended level) as well as a more favorable perception of the newsletter as interesting and helpful, and a greater number of types of persons with whom the subject talked to about the newsletter and shared her newsletter -- each of which center about the newsletter. Also included in this cluster are two items of verbal endorsement -- more favorable attitudes toward concern for environmental quality and environmental action. Accordingly, it appears that while all the items in this cluster revolve about environmental issues and environmental action, the emphasis is more on verbal than overt behavioral items. This may be the reason why other environmental action items, which required more active behavioral involvement, did not emerge in this cluster.

The second cluster contains two environmental action items dealing with increased recycling of glass and paper as well as four demographic items dealing with time. More specifically, in this cluster were four time-related items indicating that: the respondent was older, had lived longer at the current address and in Ingham County and spent a greater amount of time on vacation trips last year. Although it cannot be verified directly in the current analysis, one suspects that subjects who scored high on the items in this cluster are either retired or near-retirement, since the working householder(s) who is well-advanced in his

or her career or job, or is retired would presumably have more time for vacation trips. Also, for this type of person one could speculate that the increased frequency of recycling glass and paper might be due to any or all of three factors: 1) Longer tenure in the community may have afforded such a person a better knowledge of the locations of, and possibly a greater opportunity to use, recycling stations. 2) It is possible, too, that the older subjects who experienced the great depression of the 1930's in this country may possess stronger personal beliefs in the worth of recycling used goods. 3) If the respondent and her spouse were retired or otherwise worked less than other subjects, it is possible that the extra spare time would give them more time to take materials to a recycling station.

It is worth noting that only two clusters emerged in the above analysis; however, even more noteworthy is the fact that there were only four significant correlations out of a possible total of 224 correlations between an environmental action item and a demographic item. This latter finding suggests that appeals to environmental action, whether defined as a single activity, or a set of activities, probably cannot be successfully directed toward any broad-based group or subsystem of persons which are homogeneous on a single demographic trait. It might be argued that such a generalization is vitiated by the fact that this study dealt only with well-educated, upper-income persons. However, a full 42 percent of the subjects reported that their highest level of educational attainment was a high school degree. Also, nearly 20 percent of the subjects reported a household income level of less than $10,000 per year. On the other

hand, it is true that nearly all the subjects were Caucasian females living within the legal limits of a moderately-sized (approximately 129,000 citizens live in Lansing according to the 1970 census) Midwestern city. Accordingly, it should be the goal of future research to explore the relationship between demographic and environmental action variables among males and other types of subjects who come from different geographic regions and different socio-cultural backgrounds.

A discussion of the findings of this experiment is not complete without a review of some of the qualifications which must be made in any generalization of results. First, there is the manner in which subjects were selected for this study. Only those persons were selected initially to be in the study who:

1. were adult females living in single-unit dwellings;
2. lived in households with an above-average (for Lansing property value in a census tract with a mean property value which was also above average;
3. responded to City Directory survey forms;
4. had a listed telephone number;
5. had registered a motor vehicle with the state of Michigan for the previous year; and
6. did not live on the end of a block and had two adjacent neighbors.

Second, as concerns the experimental treatments and data collection procedures for the first questionnaire, the results of the tests of the three main hypotheses are restricted to those subjects who during the course of the experiment:

1. did not move from the current address, or for the no-send-to-neighbors subjects, who did not move to another address within the city without the project being notified of their forwarding address;

2. in the send-to-neighbors conditions did not have neighbors who moved from the current address;

3. did not refuse at the initial contact to fill in the first questionnaire; and

4. did not fail to mail in forms that were dropped off or mailed out.

Furthermore, even disregarding the various restrictions of selection and attrition, it should be remembered that the main results are based on only 121 subjects who may or may not be representative of the universe of their peers who also could have met the above criteria. Moreover, the observed effects for the restricted sample of environmental action items may not be generalizeable to a larger or different sample of items. In addition, it may be that the results of this study were contingent upon the specific newsletter, prod calls, prod agent, interviewers, or data collection techniques employed in this study as well as upon the specific geographic locale and time period in which the study occurred.

Notwithstanding these qualifications it is felt that the results are probably representative of those that might be expected using similar techniques for a large number of persons in this country. For example, as concerns selection criteria, the variables of city size and geographic locale may be relatively unimportant compared to factors such as availability of recycling stations within a city or the price and availability of low-lead gasoline. Furthermore, the City Directory is

usually quite exhaustive; also, most households have at least one motor vehicle and, therefore, must register it with the state. Additionally, few households are presently without a telephone having a listed number. Finally, although houses with corner lots may be more expensive than houses not on the corners or ends of blocks, this is probably due to increased household income, which was not found to be correlated with any of the environmental action variables in the current study.

There are two major implications of the results of this study for environmental action groups which are involved in disseminating environmental action information to private citizens. First, where a printed format such as a newsletter is being used exclusively in an effort to create behavioral change, as in the case of attempting to increase environmental action, there should be a critical examination of whether or not the use of printed information alone is worth continuing without some firm evidence of its effectiveness. The present results suggest that an environmental action information dissemination medium which consists solely of printed matter is a waste of resources, financially and otherwise, if the goal is to increase citizen participation in environmental action. Secondly, if an organization is committed to the use of printed information to involve citizens in environmental action, it would be better to supplement this type of technique with some form of personal contact. The current study suggests that two phone calls can be used in conjunction with a newsletter to effectively stimulate environmental action. The relative effectiveness of more than two prod calls is uncertain, although one might guess that they would

be at least more effective than no personal contact, as might a single prod call. A home visit would probably be even more effective than two prod calls, although the additional time and expense of such a technique would render it impractical for most situations.

Another recommendation based on the results of this study is that systematic efforts to increase citizen environmental action should concentrate more on actual environmentally-related behaviors than on environmentally-related attitudes and beliefs. In the present study attitudes expressing concern for environmental quality and action were generally very high for all subjects. By way of illustration, more than 95 percent of all subjects indicated agreement with the attitude items "If mankind is going to survive at all, pollution must be stopped," and "Leaves and food scraps should be composted whenever possible." While it may be important to raise the public consciousness about ecology and pollution problems, as expressed by environmental beliefs and attitudes, the level of verbalized public concern is probably already at a high point beyond which it would be difficult to increase. The limited variability in attitude scores may be viewed as one reason why environmental attitudes were found to cluster with only one environmental action item; however, even with more varied attitudes among the group of persons being studied, an extensive amount of research from other areas (cf., Wicker, 1969) suggests that there might still be a discrepancy between measures of environmental actions and attitudes. That is, a person who evinces very high concerns for environmental degradation and the need for individual environmental action may

actually show very little involvement in personal environmental action. Accordingly, it is recommended here that environmental attitudes should not be used as the main indicators for action programs concerned with environmentally-related behaviors. In fact, in a broader sense, one wonders what is the purpose or practical value for environmental action of publications designed for public consumption which are oriented solely around matters such as attitudes and ethics (e.g., EPA, 1971).

The results of this study also suggest that environmental action should not be viewed as homogeneous collections of activities which are necessarily related to one another at the level of individual practice. The present results show that persons who engage extensively in one form of environmental action may not do so for a different action. In terms of personal practice, there does not appear to be an "ecology" of environmental actions wherein various activities are inter-related. Consequently, environmental action campaigns would be well-advised to assume that an increase in participation in a particular activity will probably not lead to an increase in another area. Each action component in an overall program should receive special attention.

In a similar vein, the results of the analysis involving demographic variables suggest that it would be incorrect to assume that one can identify demographically defined groups of persons who might be more likely than others to engage in environmental action. Participation in environmental action probably depends more on characteristics which are idiosyncratic to individual families and households. The tentative suggestion to be made here is that a widespread environmental

action campaign should not dwell on creating different change or persuasion techniques for different types of people.

Finally, this study is indicative of the need for systematic evaluations of environmental programs which have a goal-directed service function. The impact of programs such as environmental information dissemination is usually not assessed and the effects of services such as public education programs are usually assumed rather than empirically verified. Empirical evidence, especially when generated from scientific research and experimentation, will in the long run provide the most rational basis for making decisions concerning program continuation and development.

Future research in this area should attempt to cross-validate the prod effect findings on different populations and determine the efficacy of one contact as well as three or more contacts. It would be interesting to see if the prod treatment could be successfully applied to other public service areas. For example, the prod treatment might be tested for its effectiveness in increasing voter registration or enrolling poverty-ridden families in federal assistance programs. Also, while the present results are not encouraging, future research might continue to investigate miscellaneous correlates of environmental action in an effort to improve predictions about the potential effectiveness of different techniques for different types of people. To cite one specific area meriting further attention, as Rogers and Shoemaker (1971) have noted, in general, there is a dearth of research information on the attributes of innovations which facilitate adoption. Similarly,

little is known about the specific attributes of environmental actions that make some of them so readily accepted while others so completely rejected by private citizens. For example, any one of the following factors may contribute to the adoption and degree of practice of an environmental action: 1) perceived economic benefit derived from adoption; 2) novelty of the action to the potential adopter; 3) degree of effort required to realize adoption and regular practice; 4) conceptual complexity of the action; and 5) perceived benefit to the environment given adoption and regular practice of an environmental action.

In addition, future research should acknowledge some of the methodological contributions of the current study and try to avoid some of its shortcomings. First, with regard to the former point, the policy of separating the administration of the relatively short main questionnaire, containing the essential environmental action measures, from the longer second questionnaire appears to be a good strategy for minimizing attrition. Thus, after initial contacts had been made and the first questionnaire had been retrieved with only a two-day call-back period, supplemented by repeated home visits and mail-prods where necessary, a full 36 percent of the second questionnaires was lost. Along these lines, it is the opinion of the interviewers that a policy of simply giving out both questionnaires (which altogether were 11 one-sided pages long) would have resulted in a severe loss of completed first questionnaires.

Another field research strategy which worked rather successfully in the present experiment was contacting the female rather than the male householders. Men were much more apt to refuse to participate in the follow-up survey. This fact can be seen in the findings from Table 3 that more than twice as many men as women refused to fill out the attitude questionnaire (i.e., Current Outlook Survey). Also, the interviewers' logs reveal that 12 of the 17 initial contact refusals were made by husbands on behalf of their wives. Similarly, the initial strategy of sending the newsletters to and prodding female householders was probably much more effective than using male householders as target subjects. Therefore, it is recommended here that if a choice is to be made, and if evidence to the contrary is not available, it is probably more beneficial to direct environmental action change efforts toward, say, wives rather than husbands in a household. It would be interesting, too, to compare the relative effectiveness of using the husbands and the wives separately and in combination as different target subjects.

Future research in this area should also strive to improve upon some of the main methodological deficiencies of this study. First, it is desirable to have some additional measure of performance on environmental action items which does not rely on a subject's verbal self-report. As several authors (e.g., Nunnally, 1967; Crano and Brewer, 1973) have observed, self-report measures are generally less preferable in terms of measurement validity than more direct measures of a person's behavior. Thus, it might be useful to have a more direct unobtrusive measure of performance in the areas of, say, fuel and water consumption. Some

examples of such measures would include the actual record of amounts of electricity, oil, and water used in a monthly period. Such information may, in certain instances, be available from local utility, power, and water agencies.

Measures of environmental action should ideally be recorded at regular intervals over a fairly prolonged time period. In the present study the average initial interview occurred about two months after the final newsletter had been sent out. At least one additional follow-up survey after six months or a year would have permitted a more accurate assessment of the duration of the prod effects and would also provide an estimate of individual environmental action fluctuation over time.

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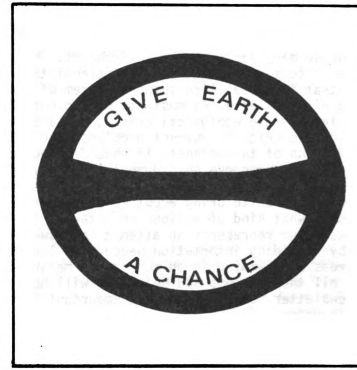
APPENDICES

APPENDIX A

THE ECO-ACTION NEWSLETTER

ECO-ACTION NEWSLETTER



ISSUE NUMBER 1 October 4, 1972

MICHIGAN STUDENT ENVIRONMENTAL CONFEDERATION
409 Seymour Ave. Lansing, MI. 48933

INTRODUCTION

The balance of connections between man, soil, water, air, plants, and animals forms the web of our environment. This balance has evolved after millions of years to the present delicate ecological system. An abuse to one of the connections can pose a threat to the balance of the whole system. This is the crux of the issue of environmental problems. They arise because man has been tearing at and abusing so many parts of the environment. The problem as a whole is so serious that several scientists have predicted that the total life support system of man is threatened with collapse. We must act now to not only prevent a large-scale ecological crisis, but also to reduce some of the critical current problems like pollution.

As citizens of this planet, it should be our personal responsibility to preserve environmental quality. It is not enough to merely talk about solutions, we must act in such a way as to bring about solutions. You may rightly ask, "What kind of action can I take?" The Eco-Action Newsletter represents an attempt to answer this question by providing information needed for locating problem areas and zeroing in on corrective measures. While not all the problems and solutions will be covered in this newsletter, some of the most important ones will be discussed.

It must be remembered, though, that this is only a beginning to the solution of a very broad problem. There is much more you, or anyone, can do if willing. But never underestimate your personal power. Your efforts, coupled with the efforts of other people, can help to give earth a chance.

RECYCLING

As an Undersecretary of the U.S. Dept. of Interior remarked recently, "Trash is our only growing resource." Similarly, getting rid of our trash is fast becoming a major problem in this country. Some 200 million tons of trash, or about one ton per person, are currently collected each year by towns and cities in the U.S. It has been estimated that by the year 1980 each individual will put out 8 lbs. of trash every day. Approximately,

90% of the trash collected is disposed of either by open dumping and burning or by landfilling, at a cost approaching $4.5 billion per year. New York City alone has been consuming land for trash disposal at the rate of about 200 acres a year. In view of increasing disposal problems as well as the problem of the reduction of raw natural resources such as timber and metals, reutilization (recycling) of waste materials is being looked at as a very worthwhile solution to the trash problem. Although recycling is not without difficulties, it has three big advantages: 1) the disposal problem is reduced; 2) the need for supplying raw materials is cut down; and 3) the to-be-recycled product is worth money.

This issue of the Eco-Action Newsletter will focus primarily on two specific aspects of the trash problem--paper refuse and containers, particularly beverage containers. Through recycling, you as an individual can relatively easily make a contribution to the solution of these particular problems.

Paper Refuse

Paper production is increasing rapidly in the U.S. every year. Most paper comes from trees, a resource which is not increasing every year. It has been estimated for example, that 17 trees are used to make a ton of newspapers. This may not seem like much until one considers that each person in the U.S. discards an average of 540 lbs. of paper each year, most of which consists of newspapers and magazines. Unfortunately, less than 20% of the paper produced in this country is recycled. But paper recycling facilities do exist in most cities. The problem is that most people do not try to have their waste paper recycled to make new paper.

ECO-ACTION

In Lansing very little paper recycling is done by private citizens even though several channels exist for such recycling.

As a Lansing resident, <u>you</u> can recycle paper by one of two alternative methods:

▲ 1. You can take your bundled newspapers, cardboard boxes, paper sacks, IBM cards and other paper

products directly to the one company in this area that reprocesses paper:

Friedland Iron & Metal Co.
314 E. Maple St.
Lansing, Phone: 482-1668

This firm pays 30 cents per 100 lbs. of paper. Magazines are not acceptable for recycling. However, if you take a daily newspaper, you may find that you have several loads a year of recycleable paper.

▲ 2. Another way to have your paper recycled is simply to call either of two very active community recycling centers--The Salvation Army (Phone 482-0821) or The Volunteers of America (Phone 484-4414)--and they will make pickups at your home, free of charge. Newspapers should be bundled or tied and preferably should be in sacks or boxes. Again, magazines are not acceptable. Pickups are made by each organization in each area of Lansing at least once a week throughout the year. You may also leave the paper bundles at their collection sites. The collection sites for The Salvation Army are located on the parking lots of the Edgemont Shopping Centers and all 3 Meijer's Thrifty Acres stores (located at 5125 W. Saginaw and 6200 S. Pennsylvania in Lansing and 2055 W. Grand River in Okemos). The collection sites for the Volunteers of America are located at the Logan Shopping Center (corner of S. Logan and Holmes Rd.), at the Spartan Store lot (corner of S. Cedar and Jolly Rd.), and in front of the Zuker Tire Company at 329 River St.

So, try to recycle your paper. And remember: for each stack of newspapers 36 inches high that you recycle, you save a tree!

The following is a list of 6 other actions which relate to the paper refuse problem:

--Support commercial paper recycling by using recycled paper for your communications.

--Reuse manila envelopes and cardboard boxes (or have them recycled to make new paper products).

--If possible take your own shopping bag with you instead of using paper bags furnished at the store.

--Keep a litter bag in your car and use it rather than littering.

--Use cloth napkins, handtowels, handkerchiefs, and diapers instead of throw-away paper ones.

Containers

Containers constitute alarge amount of the trash which is dumped every year. It has been predicted that within the near future over the course of a year the average person will discard 135 bottles and jars and 250 metal cans as well as 338 caps and crowns. Since most non-beverage containers including those for detergents, polishes, waxes, vegetables, fruits, luncheon meats, shaving creams, deodorants, pesticides, etc., are at present of rather limited practical value for recycling, this section will be limited mainly to beverage containers.

A study done at the University of Illinois clearly showed the advantage of returnable containers over non-returnable containers. It was found that it took more than 3 times as much energy (e.g., in the form of electricity and gas) to deliver a gallon of soft drink in eight non-returnable bottles than in a returnable bottle refilled eight times. Also, it was found that delivery of 12-ounce cans used up nearly 3 times as much energy as 12-ounce returnable bottles. Accordingly, from a utilization of natural resources standpoint, the use of returnable containers is definitely preferable to non-returnable containers.

Returnable containers are also less expensive for the consumer. A recent survey indicated that U.S. consumers could save as much as $6 million per year by buying soft drinks in returnable containers. As for beer, if drinkers bought their beer in returnable containers, they would save approximately $840 million per year. Bringing it closer to home, a survey made by the Michigan Student Environmental Confederation in the beginning of this month revealed the following prices for Coca-Cola and Pepsi in returnable and non-returnable containers at a large Lansing super-market:

	Total Cost	Cost Per-Ounce
Coca-Cola		
8 Returnable 16 oz. bottles	$ .97*	.76*¢
8 Non-returnable 10 oz. bottles	1.14	1.42
6 Non-returnable 12 oz. cans	.95	1.32
Pepsi-Cola		
8 Returnable 16 oz. bottles	$ 1.05*	.82*¢
8 Non-returnable 10 oz. bottles	1.14	1.42
8 Non-returnable 12 oz. cans	1.21	1.26

*Excluding bottle deposit

As can be seen in the cost per-ounce column in the above table, beverages in returnable containers are considerably less expensive with costs ranging from 54% to 65% (depending on the brand and type of container) of the cost for beverages in non-returnable containers.

Finally, in addition to preservation of natural resources and consumer cost, there is yet another reason why returnable containers are preferable to non-returnables. Frequently, the non-returnable containers are not disposed of properly and manage to become litter along streams and rivers and streets and highways.

ECO-ACTION

In view of the above factors, it is recommended that when you buy soft drinks or beer, you should:

▲ 1. Buy (and return) returnable rather than non-returnable containers, whenever possible. If your grocer does not stock returnable bottles, ask him to do so.

▲ 2. If you must buy non-returnable containers, purchase (and take to a recycling station) glass rather than metal containers. It costs less to recycle glass and even if recycling does not occur, the raw

materials used to make glass (e.g., sand and crushed rock) are in much larger supply and are less costly than those used to make cans (e.g., steel, tin, and aluminum).

▲ 3. If you must buy metal containers, buy all-aluminum cans rather than the standard steel or tin and steel (and sometimes also aluminum) cans. All-aluminum cans have a higher recycling value than other cans. Also, at present, Lansing recycling facilities will accept only all-aluminum cans.

Action Information for Containers

1. Returnable bottles are available for the following beverages. SOFT DRINKS--Coca-Cola, Diet-Rite Cola, Dr. Pepper, Hires, Mountain Dew, Nehi, Orange Crush, Pepsi and Diet Pepsi, RC Cola, Squirt, and Vernor's. The typical deposit on each soft drink bottle is 5¢. BEER: Alps Brau, Blatz, Budweiser, Carling Black Label, Drewry's, Goebel, Hamm's, Miller's, Old Milwaukee, Pabst, Schlitz, and Stroh's. Deposit on a returnable beer bottle is 2¢.

2. To recycle galss containers, you can either call the Salvation Army and have them pick up your glass (or take it to one of their collection sites) or take the glass to one of the recycling bins for glass located in the parking lots of each of the three area Meijer's Thrifty Acres stores.

3. All-aluminum cans can be recognized by their one-piece construction and by the fact that they have no seam running down the side of the can, they have rounded bottoms and they are not magnetic like other metal cans. In this area, the following beverages (beer only) come in all-aluminum cans: Ballantine, Carling Black Label, Drewry's, Miller Malt, and Schlitz. All of these brands, except Carling Black Label, also distribute cans which are not all-aluminum, so if you want to purchase an all-aluminum can in these brands, examine the cans for the all-aluminum features listed above.

To recycle aluminum cans, either call the Salvation

Army or Volunteers of America and they will pick them up at your home (or take them to one of their collection sites), or take the cans to one of the following firms and receive from 8¢ to 10¢ per pound for the cans:

Friedland Iron & Metal Co.
314 E. Maple
Lansing Phone 482-1668

Service Beer & Wine Sales, Inc.
914 Terminal Rd.
Lansing Phone 484-4429

Simon Iron & Steel Corp.
1900 W. Willow
Lansing Phone 372-6600

Other aluminum goods which can be recycled are: all-aluminum luncheon meat cans (e.g., Armour meats), T.V. dinner trays, pie pans, lawn furniture, and, of course, aluminum foil.

If you are interested in selling other types of metal (such as brass, copper, steel) to these firms for recycling, give them a call.

The following is a list of 3 other actions which are relevant to the container problem:

--When using pop-top cans, put the pop-top tab inside the can as soon as you have pulled the tab. It will not interfere with drinking at all and it may help to prevent litter.

--Avoid using aerosol cans. Not only are they unrecycleable but they can be dangerous (especially if heated or punctured).

--Other commonly-used glass products which can be recycled include baby food jars, fruit jars, and syrup, ketchup, mustard, mayonnaise, and pickle containers.

A final note. Returnable bottles used to make an average of about 80 round trips but today they average from 9 to 15 trips for most cities, although the average has dropped to as low as 4 for certain cities. Try to boost this average. Return all returnable bottles.

A. The First Eco-Action Newsletter

ECO-ACTION NEWSLETTER

ISSUE NUMBER 2 October 25, 1972

MICHIGAN STUDENT ENVIRONMENTAL CONFEDERATION

409 Seymour Ave. Lansing, MI. 48933

". . . In the final analysis the fight for a liveable world will not be won by loopholed-riddled legislation or lawsuits. Rather it will be won by individuals who change their lifestyles to more ecological ways of living--and in doing so set an example for others to follow." --*Environment Action Bulletin* (January 23, 1971)

CONSERVING WATER

It is estimated that each person, directly or indirectly, uses 150 gallons of water every day, even though personal water use in the home by no means constitutes the largest part of all the water used in this country. About 80% of this amount is converted into sewage. The present U.S. investment in sewers and sewage treatment plants alone is worth about $12 billion, with increasing user demands adding another $1.6 billion a year.

In certain parts of the U.S., such as large East Coast metropolitan areas and towns and cities in the Southwest, water is a scarce resource. Experts have predicted that in the near future many more areas in this country will be in short supply of usable water. Fortunately, many cities such as Lansing do not have a water shortage. However, while water may be in abundant supply at present and the average cost to citizens of water may be fairly low (although the cost of water supply and treatment is usually more than that found just in water bills--for example, sewage treatment is usually financed partially by property taxes), water delivery and sewage treatment use up other natural resources in the form of electricity, fossil fuels, chemicals, etc., which are not in abundant supply.

ECO-ACTION

You can help reduce the quantity of water used in your home, and thereby not only decrease the cost of your water bills, but also help reduce the consumption of resources needed to treat and deliver water in Lansing by practicing the following water-conservation activities:

▲ 1. Don't wash dishes in constantly running water. Thirty gallons of water can be wasted each meal by just letting the faucets run while washing dishes. If you have an automatic dishwasher, wash only full loads. A typical automatic dishwasher uses from 12 to 16 gallons of water whether it washes a full load or a teaspoon.

▲ 2. Similarly, if you have a clothes washer, wash only full loads in it. A typical clothes washer uses about 45 gallons of water for a 12 pound load.

▲ 3. Try not to let the water run while you brush your teeth.

▲ 4. Keep a bottle of drinking water in the refrigerator. This saves water which is ordinarily wasted when you run tap water until it gets cold enough to drink.

▲ 5. Don't let your faucets leak. A leak that will fill a cup in 10 minutes wastes 3285 gallons a year. In the case of hot water, this is water you must heat.

▲ 6. You might consider taking short showers instead of long baths. This can sometimes save as much as 20 gallons of water each time you bathe.

▲ 7. Flushing the average home toilet requires as much as 6 gallons per flush. However, most toilets were not constructed to operate efficiently. It has been estimated that the actual amount needed per flush is only about 4 gallons. To reduce the amount of water used when flushing, either of two methods can be employed: (1) A brick (or 2 bricks), or a closed container such as a full, stoppered bottle, can be placed in the water tank of your toilet to reduce the amount of water required for flushing (see diagram on the next page). A single three-hole brick will displace about a quart of water. Thus, if each of 30,000 Lansing units flushing only 10 times a day had a brick in the water tank, 75,000 gallons of water would be conserved each day. (2) Another way to achieve the same effect, if you have a minimum of mechanical ability, is to bend the float rod in the water tank of your toilet downwards so that not as much water is filled up in the tank after flushing.

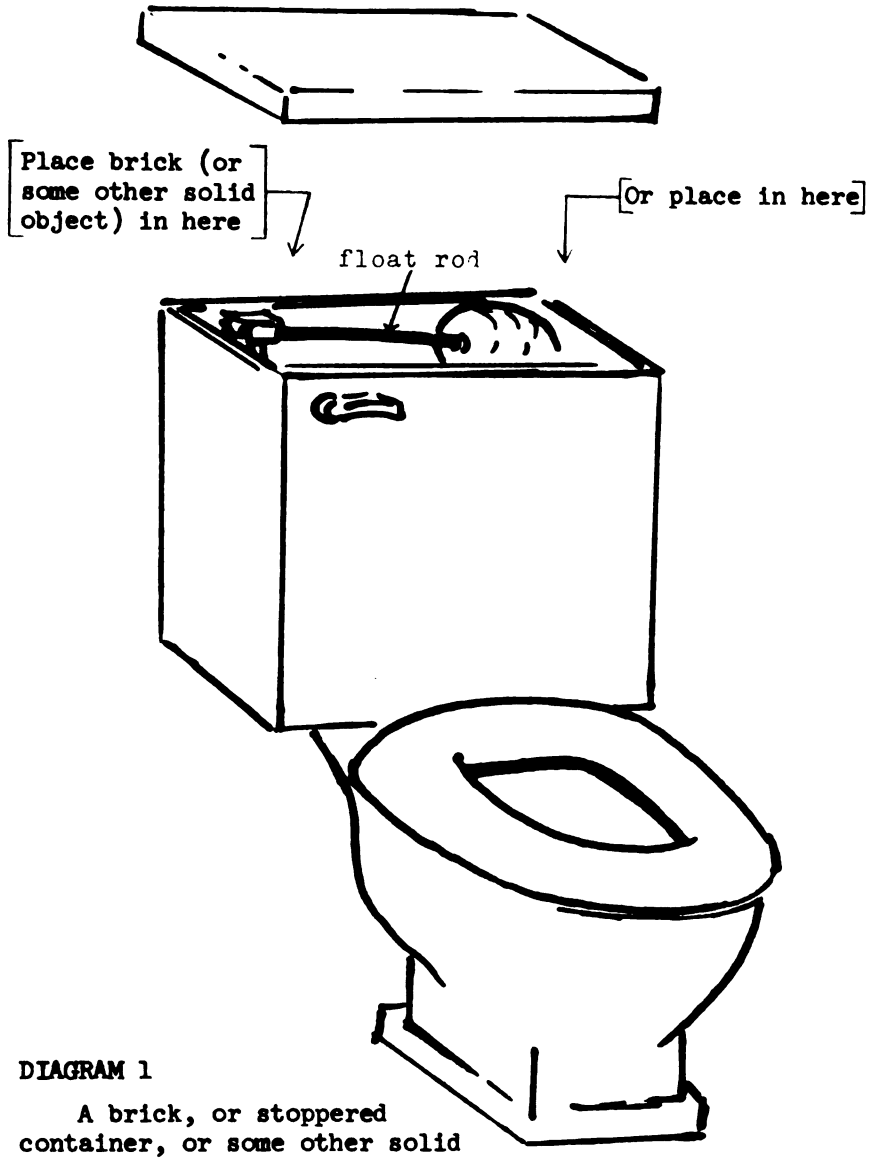


DIAGRAM 1

A brick, or stoppered container, or some other solid object placed in the water tank of a toilet as shown above will displace water in the tank. Thus, the amount of water required for flushing will be reduced.

COMPOSTING

In most settled and cultivated areas of America there exists today about 50% less topsoil than there was 350 years ago. The expansion of houses, buildings, highways, parking lots and other structures which cover the earth's surface, as well as the continued agricultural demand on existing land, makes good topsoil of ever-increasing value. Anyone who has recently purchased topsoil, potting soil, or soil additives for their lawn or garden can appreciate this fact.

One way to help directly improve the quality of soil and at the same time help reduce the solid waste disposal problem is through composting. Compost is essentially manure which is prepared by decomposing or fermenting dead organic matter such as grass clippings, food scraps, weeds, sawdust, and leaves. Composting is used as a source of organic matter for adding humus to soils (especially sandy soils), making potting soils, and generally for improving soil structure. Compost provides a complete, revitalizing and inexpensive form of soil additive for gardens, flower beds, trees, and shrubs.

HOW TO MAKE COMPOST

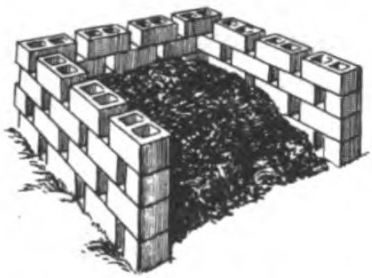
A. The Easy Way: Compost is easy to make. The simplest way to make compost is by using a compost heap. The heap can be developed by following a 3-step procedure: (1) Place, preferably in layers, the materials to be composted in a heap or pile on the ground. (2) As the heap is built up, a small amount of rich soil should be added to supply needed nitrogen (which is used for food by the decomposing bacteria). (3) Turn or stir the heap every 6 weeks or so until the material is decomposed and occasionally water it to speed up the decomposition process. When the compost soil turns a dark rich color it is ready for use.

For some materials complete decomposition may take a year or more; however, the smaller the size of the organic materials put into the heap, the faster

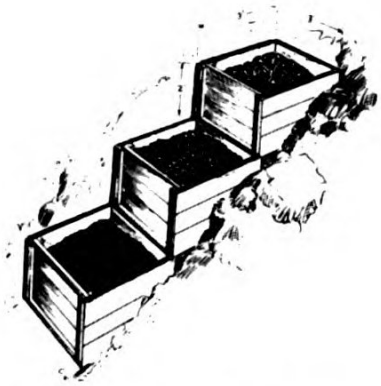
they will decompose. Therefore, it is a good idea to make the to-be-composted material as small as possible. For example, leaves can be shredded by a lawn mower or food scraps can be chopped up before composting. Relatively fine-grained material will decompose in a few months.

▲B. Another Way to Make Compost: A somewhat better but more complicated procedure for making compost is as follows: (1) Spread a portion of the materials to be composted in a layer 6 to 8 inches thick. (2) Sprinkle over this material a small amount of commercial fertilizer such as 5-20-20 or 10-10-10 or a small amount of animal manure. (3) Water the layer lightly but not enough to wash away the fertilizer. (4) Add additional layers 6 to 8 inches thick on top of the first layer. (5) As each additional layer is added, put a small amount of fertile soil on the layer to speed up bacterial action and decomposition. (6) Keep the heap moist. (7) Stir the heap two or three times at two-week intervals to hasten decomposition. Using this procedure and keeping the size of the material put in the heap relatively small, compost can be produced in about 6 weeks. (From *Composting*, published by Michigan State University, June 1970.)

Regarding where to make compost, there are no set rules. Compost heaps or compost pits can usually be easily started in your back yard. It is recommended that the site for the heap be close to the source of the waste organic materials and close to where most of the compost is used. The size of the heap is not too important, although it probably should not be higher than 5 feet or wider than 10 to 12 feet. As for the construction of the heap, many gardeners use concrete blocks placed around 2 or 3 sides of the heap. Bins to contain the compost can also be relatively easily constructed of rocks, stones, bricks, or wood. Diagrams of two types of compost storage sites are shown on the next page.



Heap enclosed by concrete blocks



Three-stage wooden bins

DIAGRAM 2 Examples of types of compost heap structures.

OTHER INFORMATION

In addition to food scraps, lawn clippings, sunflower heads, sod, sawdust, weeds and leaves, other materials which can be used to make compost include: coffee wastes, crushed limestone or lime (to counteract excessive acidity in the compost and to reduce offensive odors), seaweed, potash, sewage sludge, soil, and wood ashes. One should be careful not to use materials infected with diseases or insects as they may remain and flourish in the heap.

If you want compost but prefer not to make a regular heap or bin, another way is to make mini-compost bins in large heavy-duty plastic bags. Material to be composted should be moistened slightly and put in the bag. Then close the bag, fasten the top, and put it in a shady place. In warm weather, humus should be ready in a few weeks at which time the bag can be filled with new material.

USE

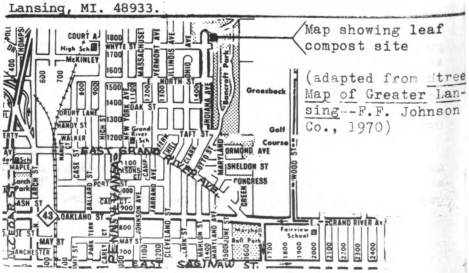
Compost is usually applied to the soil in fall or spring. Many gardeners apply compost to their soil about a month before planting when the compost is fine-grained; or in the fall in half-decomposed form.

Compost should be applied annually from one to three inches thick. For vegetable gardens, the compost can be mixed with topsoil and applied as a mulch. When adding compost to your lawn, make sure that it is finely ground-up, so that the grass won't be smothered.

LEAF-COMPOSTING

If you are interested in composting but do not at this time wish to start your own compost heap, you may wish to contribute your leaves to a large field compost. The Lansing Parks Department is currently accepting leaves for composting at a site located at approximately the 1800 block on Indiana Avenue in Lansing. The map shown below indicates the position of the site.

The site is square in shape and is marked off at its four corners by stakes with orange flags attached. To contribute any or all of your leaves (and grass clippings), simply drive out to the site and put the leaves on the ground. It is preferred that you dump the leaves on the middle of the site or a few yards from the street. Please do not dump any trash on the site. It is not a landfill. If you would like to find out about the possibility of obtaining some leaf compost for next year, write to Mr. Charles Hayden, Director, Lansing Parks and Recreation Department, City Hall, Fourth Floor, Lansing, MI. 48933.



Map showing leaf compost site

(adapted from Street Map of Greater Lansing--F.F. Johnson Co., 1970)

B. The Second Eco-Action Newsletter

APPENDIX B

INTRODUCTORY LETTER TO SUBJECTS

THE MICHIGAN STUDENT ENVIRONMENTAL CONFEDERATION
409 Seymour Avenue
Lansing, Michigan 48933

September 26, 1972

Dear Mrs. Smythe:

The Michigan Student Environmental Confederation (MSEC), with offices in downtown Lansing, is a non-profit organization devoted to the preservation of environmental quality. Some of our ongoing functions during the past three years have included the following: lobbying for environmental legislation at the state Capitol, publishing a regular newspaper--*Earth Beat*--which deals with the "eco-activities" of various state and local groups and individuals, sponsoring and coordinating workshops and conferences on environmental affairs, compiling and distributing information relevant to environmental issues, and serving as a community resource center for groups and individuals working on environmental problems.

In line with our goal to extend our services to more local citizens, MSEC is currently starting a pilot program of community education which will hopefully begin to inform Lansing residents how they can participate in the fight against pollution and the maintenance of environmental quality. Accordingly, you and a number of other local residents have been selected (at random from the City Directory) to be involved in a pilot Environmental Action Awareness Project. The purpose of this project is simply to show the private citizen how he or she can help preserve environmental quality through his or her individual actions. Thus, over the course of the next few months you will receive a regular eco-action newsletter which outlines various environmental problems and specific things you can do to help solve these problems. There is no charge or obligation on your part. We ask only that you (and other members of your family) read the newsletter and try out some of the tips and suggestions. During the program and at its completion we would like to receive your comments and suggestions to help us determine the future usefulness of this kind of project.

You will receive the first issue of the eco-action newsletter next week. Two of your neighbors, Mrs. Browne and Mrs. Jones, will also receive the newsletter. We hope you will discuss it with them. In any event, we hope you and they will find the newsletter both interesting and useful. Thank you in advance for your interest in this project.

Sincerely,

John W. Lounsbury
For the Staff of MSEC

Note.--The foregoing letter typifies the type of letter which was sent to subjects in the prod/send-to-neighbors conditions. Letters for no-send-to-neighbors conditions were characterized by an omission of reference to two of the subject's neighbors. Letters to subjects in the no-prod conditions did not contain the phrase "during the program" to indicate when their comments and suggestions would be received.

APPENDIX C

PROD CALL FORMAT

APPENDIX C

PROD CALL FORMAT

General Prod Call Format

The prod call format involved two standard choice points: 1) First the subject was asked if she had been receiving the Eco-Action Newsletter. If the answer to this question was "no," the prod agent explained what it was and what it looked like and asked again. If the subject still did not recall receiving the newsletter, the prod agent signed off by assuring the subject that she would be receiving the newsletter. 2) If the subject said she had been receiving the newsletter, she was asked if she had read it. If she had not read it, the prod agent signed off by urging her to read it. If she had been reading it, she was asked if she had followed some of the suggestions set forth in the newsletter. For the first prod call, the agent listed off several examples of the suggestions, including recycling glass and paper, putting a brick in the toilet, and buying only returnable beverage bottles. For the second call, examples included avoiding using enzyme pre-soaks, using less laundry detergent than the manufacturer recommends and using a measuring device for detergents, and using low-lead gas in the car. The subject was verbally reinforced for any suggestions she had followed. Additional discussion was focused around other environmental actions or issues which were brought up by the subject.

A maximum time limit of approximately five minutes was established for a conversation. The prod agent made an effort to be both friendly and cordial to the subject as well as to try to focus the discussion on environmental action. The prod agent recorded the time spent on a conversation with a stopwatch to the nearest second. He also wrote down the subject's response to the question about following suggestions set forth in the newsletter. In addition, the prod agent noted any name or address errors which the subject mentioned in regard to the address labels for the newsletter. Also, if the subject planned to move and gave the information to the prod agent, her new address and phone number were recorded.

An Example of a Simulated Prod Call

The following is an example of a simulated initial prod call based on a conversation with a subject who was highly involved in environmental action (in this example, P indicates the prod agent, while S indicates the subject).

S: "Hello?"

P: "Hello, Mrs. Smythe? This is John Lounsbury calling from the Michigan Student Environmental Confederation. You've been receiving our Eco-Action Newsletter, haven't you?"

S: "Oh yes, I have. We just got the last one on Friday."

P: "Fine, have you been reading the newsletter?"

S: "Yes, I sure have, it is very interesting. My husband and I both read it."

P: "Have you followed any of the suggestions set forth in the newsletter such as recycling glass and paper, or putting a brick in your toilet?"

S: "Right. We've started doing most of them. We take glass and paper out to the bins at Meijer's [a local shopping center where recycling bins are located] and my husband has even put a brick in the toilet. How 'bout that?"

P: "Say, that's great. Yeah, the lot at Meijer's is convenient for many people to take glass and paper to. And do you make an effort to buy only returnable bottles?"

S: "We certainly do. I've also taken the newsletters down to my church group for them to read."

P: "Tremendous! It sounds like you've become very involved in environmental action."

S: "We just wish more people would get involved in doing things. One of the things I'd like to see is for them to get rid of the drop forge at Olds [the local Oldsmobile factory]. We live about a half-mile away from it and it gets so noisy the kids can't sleep some nights. It's a real headache. Talk about noise pollution."

P: "Yes, it certainly is a problem. It may have to be handled through some kind of legislative action or city ordinance but it may be difficult to do. Still, it's good to hear that local citizens like yourselves are so involved."

S: "Well, we try to help out. By the way, should we send money for the newsletter?"

P: "No, there's no need to do that. We're only trying it out on a small scale right now, so the cost is not very much. But thank you anyway."

S: "I see. That's good."

P: "But we will continue to send you the newsletter and we'll be talking with you again in a few weeks."

S: "Fine."

P: "In the meantime, keep up the good work. It was nice talking with you."

S: "Thank <u>you</u> for calling and thanks for sending us the newsletter."

P: "You're welcome. Goodbye."

S: "Goodbye."

APPENDIX D

PRE-FOLLOW-UP LETTERS TO SUBJECTS

A. Example of a Letter for a Subject Who Had Been Receiving the Newsletter.

MICHIGAN STUDENT ENVIRONMENTAL CONFEDERATION
409 Seymour Avenue
Lansing, Michigan 48933

January 12, 1973

Dear Mrs. Smythe:

This is the final issue of the current series of the Eco-Action Newsletter. As you may recall from our introductory letter, the Eco-Action Newsletter was being tried out by the Michigan Student Environmental Confederation (MSEC) on a pilot basis. Depending on how it has been received, we will again make available the newsletter in its original or in a modified form to the Lansing public later this year. To help us now evaluate the newsletter, we would like to receive your ideas, opinions, and suggestions. Therefore, one of our staff will be in your neighborhood sometime next month to drop off some forms for you to fill out. Your information will be very valuable to us for planning future versions of the newsletter.

We hope you have enjoyed receiving the Eco-Action Newsletter and we hope you have found it to be informative and useful. Thank you for your interest in this project.

Sincerely,

John Lounsbury
For the Staff of MSEC

B. Example of a Letter for a Subject Who Had Not Been Receiving the Newsletter

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MICHIGAN STUDENT ENVIRONMENTAL CONFEDERATION
409 Seymour Avenue
Lansing, Michigan 48933

January 22, 1973

Dear Mrs. Whyte:

The Michigan Student Environmental Confederation (MSEC), with offices in downtown Lansing, is a non-profit organization devoted to the preservation of environmental quality. Some of our ongoing functions during the past two years have included the following: lobbying for environmental legislation at the state Capitol, publishing a regular newspaper (Michigan *EARTH BEAT*) which deals with the "eco-activities" of various state and local groups and individuals, sponsoring and coordinating workshops and conferences on environmental affairs, compiling and distributing information relevant to environmental issues, and serving as a community resource center for groups and individuals working on environmental problems.

One of the things we are currently working on is a survey of environmental attitude and practices among local residents. Accordingly, you and a number of other persons in the Lansing community have been selected (at random from the City Directory) to be involved in an environmental issues survey. The purpose of this survey is to discover people's attitudes toward environmental issues and concern for environmental activities.

Your participation in the survey will be a great help to us in planning further environmental action in the Lansing area. One of our staff will be in your neighborhood sometime during the next few weeks to drop off some forms for you to fill out.

Thank you in advance for your interest and cooperation in this project.

Sincerely,

John Lounsbury
For the Staff of MSEC

APPENDIX E

FOLLOW-UP LETTER FOR SUBJECTS WHO HAD NOT MAILED IN QUESTIONNAIRES

MICHIGAN STUDENT ENVIRONMENTAL CONFEDERATION
409 Seymour Avenue
Lansing, Michigan 48933

April 23, 1973

Dear Mrs. Smythe:

We recently sent you some survey forms. If you have not yet returned the completed questionnaire, we would greatly appreciate it if you would do so.

Thank you for your cooperation. We really appreciate it.

Sincerely,

John Lounsbury
For the Staff of the
Michigan Student
Environmental Confederation

Note.--The above letter was sent to subjects who had been mailed the follow-up questionnaires. For those subjects who had been left questionnaires to fill out and return by mail, the above letter was used with one alteration: The first sentence read, "We recently dropped off some survey forms for you to fill out."

APPENDIX F

THE FIRST FOLLOW-UP QUESTIONNAIRE

APPENDIX F

THE FIRST FOLLOW-UP QUESTIONNAIRE

CURRENT ACTIVITIES

For each of the following environmentally-related activities (1 through 9) indicate how often, during the last three months, your household has been practicing these activities by circling one of the six numbers following the activity. The numbers, ranging from 1 to 6, stand for:

1--NEVER
2--ONCE IN A GREAT WHILE
3--SOMETIMES
4--FREQUENTLY
5--ALMOST ALWAYS
6--ALWAYS

		NEVER	ONCE IN A GREAT WHILE	SOMETIMES	FREQUENTLY	ALMOST ALWAYS	ALWAYS
1.	When needed, take paper to a recycling station (or have it picked up by a voluntary group)	1	2	3	4	5	6
2.	When needed, take glass to a recycling station (or have it picked up by a voluntary group)	1	2	3	4	5	6
3.	When needed, use a compost heap to dispose of organic materials such as food scraps, lawn clippings, leaves, etc.	1	2	3	4	5	6
4.	Use unnecessary electrical appliances such as electric can openers, electric combs, electric hedge trimmers, electric manicure sets, electric pencil sharpeners, electric swizzle sticks, and electric toothbrushes . .	1	2	3	4	5	6
5.	Use enzyme presoaks such as BIZ or Axion when doing laundry	1	2	3	4	5	6
6.	Buy food products with unnecessary plastic packaging such as individually wrapped (slices) cheese, frozen food packaged in cooking pouches, and plastic-wrapped meat	1	2	3	4	5	6
7.	Use less detergent when washing clothes than the manufacturer suggests	1	2	3	4	5	6
8.	Measure out the amount of detergent for clothes washing with a measuring cup or some other device	1	2	3	4	5	6
9.	Make an active effort to turn off unneeded lights around the house	1	2	3	4	5	6

The following items (10 through 13) also apply to your household for the last three months:

10. When you put gas in your car, approximately what percent of the time do you use low-lead gas?
    0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
    (CIRCLE ONE)

11. Approximately what percent of the beverage bottles you buy are returnables?
    0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
    (CIRCLE ONE)

12. If you buy returnable beverage bottles, do you usually return them to the store? YES NO
    (CIRCLE ONE)

13. When you use your electric or gas-operated clothes washer and dishwasher, approximately what percent of the time do you run only full loads?
    0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
    (CIRCLE ONE)

****

For each of the following environmentally-related actions (14 through 18), indicate whether or not you or some other member of your household has, during the last 6 months, done it by circling one of the two choices (YES or NO) following the action.

14. Placed a brick (or stoppered container) or bent the float rod in the water tank of your toilet to conserve water when flushing . . . . . YES NO

15. Requested information from an environmental action group (or some other organization) on how to save on your utility bills . . . . . YES NO

16. Joined or sent in a contribution to a local environmental action group . . . . . YES NO

17. Joined or sent in a contribution to a national environmental action group . . . . . YES NO

18. Switched to fluorescent lighting for at least one lamp or light fixture . . . . . YES NO

****

19. In the space below, list any other environmentally-related activities, which you or any other member of your household have done or have been doing on a regular basis during the last three months:

_____

_____

APPENDIX G

THE SECOND FOLLOW-UP QUESTIONNAIRE

APPENDIX G

THE SECOND FOLLOW-UP QUESTIONNAIRE

THE ECO-ACTION NEWSLETTER

The following questions concern the Eco-Action Newsletter you have been receiving in the mail.

1. In general, how interesting do you find the newsletter?
   a) Not interesting
   b) Slightly interesting
   c) Fairly interesting
   d) Very interesting
   e) Extremely interesting
   (CIRCLE ONE)

2. In general, how helpful do you find the suggestions set forth in the newsletter?
   a) Not helpful
   b) Slightly helpful
   c) Fairly helpful
   d) Very helpful
   e) Extremely helpful
   (CIRCLE ONE)

3. Who has been reading the newsletter?
   a) Yourself
   b) Your spouse
   c) Your children
   d) Your neighbor (or neighbors)
   e) A friend (or friends)
   f) People with whom you work
   g) Other persons (specify _____)
   (CIRCLE ONE OR MORE)

4. Who have you been talking about the contents of the newsletter to?
   a) Nobody
   b) Your spouse
   c) Your children
   d) Your neighbor (or neighbors)
   e) A friend (or friends)
   f) People with whom you work
   g) Other persons (specify _____)
   (CIRCLE ONE OR MORE)

5. What other areas would you like to see covered in the newsletter that have not been so far? (WRITE IN)

_____

_____

(Continued on other side)

6. We have a number of extra copies of the first 5 issues of the Eco-Action Newsletter. If you would like to have a copy of an issue (or issues) sent to someone you think would be interested in reading it, please write their name, address, and which issue you would like them to receive in the space below, and we will send it to them (free of charge).

Name and Address	Issue #
_____	_____
_____	_____
_____	_____
_____	_____

MISCELLANEOUS

In general to what extent do you think each of the following terms describes how you feel about the contact we made with you by phone?

a.	INTERESTING--	1. Not at all	2. Somewhat	3. Quite	4. Very	(CIRCLE ONE)
b.	HELPFUL--	1. Not at all	2. Somewhat	3. Quite	4. Very	(CIRCLE ONE)
c.	SINCERE--	1. Not at all	2. Somewhat	3. Quite	4. Very	(CIRCLE ONE)
d.	UNINFORMATIVE--	1. Not at all	2. Somewhat	3. Quite	4. Very	(CIRCLE ONE)
e.	ANNOYING--	1. Not at all	2. Somewhat	3. Quite	4. Very	(CIRCLE ONE)
f.	UNFRIENDLY--	1. Not at all	2. Somewhat	3. Quite	4. Very	(CIRCLE ONE)

Other Comments: _____

_____

_____

_____

CURRENT OUTLOOK SURVEY

The purpose of this survey is to obtain information about the concerns that different people have for current issues, especially environmentally-related issues. There is no need for you to put your name on this survey. Please fill out all the items.

Thank you in advance for your cooperation!

General Information

1. What is your sex? Male Female (CIRCLE ONE)

2. What is your marital status? Married Single (CIRCLE ONE)
   If married, how many children do you have? 1 2 3 4 5 more
   (If more, specify how many _____) (CIRCLE ONE)

3. In what year were you born? _____ (WRITE IN)

4. What is your occupation? _____ (WRITE IN)
   If retired, what was your occupation? _____ (WRITE IN)
   If married, what is your spouse's occupation? _____ (WRITE IN)

5. What is your religious affiliation? Protestant Catholic Jewish None Other (CIRCLE ONE)
   If other, please specify _____ (WRITE IN)

6. Do you have any brothers or sisters? Yes No (CIRCLE ONE)
   If yes, how many? _____
   If yes, were you the:
   a) first born
   b) second born
   c) third born
   d) fourth born
   e) other (specify _____)
   (CIRCLE ONE)

7. What was the size of the city or town you grew up in (6 to 16 years old)?
   a) Rural (no city or town)
   b) 1 - 1,000 people
   c) 1,000 - 10,000 people
   d) 10,000 - 100,000 people
   e) over 100,000 people
   f) cities of different sizes
   (CIRCLE ONE)

8. What was the last grade of school you completed?
   a) 8th grade or less
   b) some high school
   c) high school graduate
   d) some college
   e) college graduate (4 year degree)
   f) some post graduate work
   g) an advanced degree
   (CIRCLE ONE)

9. What was the income of your household last year?
   a) less than $5,000
   b) $5,000 - $10,000
   c) $10,000 - $15,000
   d) $15,000 - $20,000
   e) more than $20,000
   (CIRCLE ONE)

10. How many days did you spend on vacation trips last year?
   a) less than 1 week
   b) 1 - 2 weeks
   c) 2 - 3 weeks
   d) 3 - 4 weeks
   e) more than 4 weeks
   (CIRCLE ONE)

11. Approximately how many hours out of a typical day in this month do you spend out-of-doors?
   a) less than 1
   b) 1 - 4
   c) 4 - 8
   d) more than 8
   (CIRCLE ONE)

12. How many cars do you have in your household? _____ (WRITE IN)

13. How many other motorized transportation vehicles do you have (including motorcycles, snowmobiles, scooters, dune buggies, etc.)?

_____ (WRITE IN)

14. What magazines, newspapers, and periodicals does your household take on a regular basis?

_____

_____
(WRITE IN)

15. What type of dwelling do you live in?
   a) house
   b) duplex
   c) apartment
   d) mobile home
   e) dormitory
   f) other (specify _____)
   (CIRCLE ONE)

16. How many years have you lived in Ingham County?
   a) less than 1 year
   b) 1 - 2 years
   c) 2 - 4 years
   d) 4 - 6 years
   e) 6 - 8 years
   f) more than 8 years
   (CIRCLE ONE)

17. How many years have you lived at the current address?
    a) less than 1 year
    b) 1 - 2 years
    c) 2 - 4 years
    d) 4 - 6 years
    e) 6 - 8 years
    f) more than 8 years
    (CIRCLE ONE)

18. Concerning the dwelling you live in, do you:
    a) own it
    b) rent it
    c) other (specify _____)
    (CIRCLE ONE)

19. How is your place of residence heated?
    a) electric
    b) gas
    c) oil
    d) coal
    e) wood
    f) other (specify _____)
    (CIRCLE ONE)

20. In your household, who is usually responsible for:
    20.1 Trash disposal?
    Husband Wife Both (CIRCLE ONE)
    20.2 Grocery shopping?
    Husband Wife Both (CIRCLE ONE)
    20.3 Purchasing small household appliances?
    Husband Wife Both (CIRCLE ONE)
    20.4 Doing the dishes?
    Husband Wife Both (CIRCLE ONE)
    20.5 Clothes-washing?
    Husband Wife Both (CIRCLE ONE)
    20.6 Taking care of the lawn and yard?
    Husband Wife Both (CIRCLE ONE)
    20.7 Minor household repairs?
    Husband Wife Both (CIRCLE ONE)
    20.8 Subscribing to magazines and periodicals?
    Husband Wife Both (CIRCLE ONE)
    20.9 Automobile maintenance?
    Husband Wife Both (CIRCLE ONE)
    20.10 Turning off lights?
    Husband Wife Both (CIRCLE ONE)

Attitudes Toward Current Issues

The purpose of the following items is to survey general attitudes toward current issues, especially environmentally-related issues. Please read the following statements carefully and indicate how much you agree or disagree with each of the statements below. Agreement or disagreement can be indicated by circling one of the six numbers following the statement. The numbers, ranging from 1 to 6, stand for:

1--STRONGLY DISAGREE
2--DISAGREE
3--SLIGHTLY DISAGREE
4--SLIGHTLY AGREE
5--AGREE
6--STRONGLY AGREE

Thus, if you strongly agree with a statement, circle the number 6 (e.g., 1 2 3 4 5 6). Or to cite another example, if you're not really certain, but you think you slightly disagree with a statement, circle the number 3 (e.g., 1 2 3 4 5 6). Please circle one number for each statement. PLEASE DO NOT SKIP ANY STATEMENT.

There are no right or wrong answers to any of these questions.

		STRONGLY DISAGREE	DISAGREE	SLIGHTLY DISAGREE	SLIGHTLY AGREE	AGREE	STRONGLY AGREE
1.	If mankind is going to survive at all, environmental pollution must be stopped	1	2	3	4	5	6
2.	People should use less detergent than the manufacturer recommends to help preserve water quality . . .	1	2	3	4	5	6
3.	The news media have exaggerated the ecological problem	1	2	3	4	5	6
4.	Putting a brick in one's toilet to conserve water is a dumb idea	1	2	3	4	5	6
5.	Overpopulation is a major source of environmental problems today	1	2	3	4	5	6
6.	It seems like a waste of time to try to conserve electricity by turning off unneeded lights around the house	1	2	3	4	5	6
7.	People with new cars should use low-lead gas	1	2	3	4	5	6
8.	People should buy (and return) beverages only in returnable containers	1	2	3	4	5	6

(Continued on other side)

		STRONGLY DISAGREE	DISAGREE	SLIGHTLY DISAGREE	SLIGHTLY AGREE	AGREE	STRONGLY AGREE
9.	I am worried about future children's chances of living in a clean environment	1	2	3	4	5	6
10.	Having a lot of money may not bring you happiness, but it sure helps	1	2	3	4	5	6
11.	People should avoid buying unnecessary plastic packaging found in such food products as individually wrapped (slices) cheese and frozen food in cooking pouches .	1	2	3	4	5	6
12.	Although polluted environments may smell bad or be unsightly, they are usually not dangerous or harmful to health	1	2	3	4	5	6
13.	Every couple in America should try not to have more than two children	1	2	3	4	5	6
14.	It seems silly to attempt to conserve natural resources by running only <u>full</u> loads in dishwashers, and clothes-washers and dryers	1	2	3	4	5	6
15.	I enjoy taking long walks	1	2	3	4	5	6
16.	Personally, I would rather have astroturf than real grass in my front lawn	1	2	3	4	5	6
17.	People should recycle used glass and paper	1	2	3	4	5	6
18.	We shouldn't worry about environmental problems because science and technology will solve them before very long	1	2	3	4	5	6
19.	I wish I could spend more time out-of-doors	1	2	3	4	5	6
20.	All endangered species of animals should be protected so that they won't become extinct	1	2	3	4	5	6
21.	I would like to be a millionaire	1	2	3	4	5	6
22.	If possible, one should join or support financially an ecology center or action group to help solve the environmental crisis	1	2	3	4	5	6
23.	I don't mind seeing billboards when I drive along highways	1	2	3	4	5	6
24.	The solution to pollution starts in the home	1	2	3	4	5	6
25.	There is nothing wrong with using electric can openers, electric pencil sharpeners, and electric manicure sets	1	2	3	4	5	6
26.	Leaves and food scraps should be composted whenever possible	1	2	3	4	5	6

Husband's form

Attitudes Toward Current Issues

The purpose of the following items is to survey general attitudes toward current issues, especially environmentally-related issues. Please read the following statements carefully and indicate how much you agree or disagree with each of the statements below. Agreement or disagreement can be indicated by circling one of the six numbers following the statement. The numbers, ranging from 1 to 6, stand for:

1--STRONGLY DISAGREE
2--DISAGREE
3--SLIGHTLY DISAGREE
4--SLIGHTLY AGREE
5--AGREE
6--STRONGLY AGREE

Thus, if you strongly agree with a statement, circle the number 6 (e.g., 1 2 3 4 5 6). Or to cite another example, if you're not really certain, but you think you slightly disagree with a statement, circle the number 3 (e.g., 1 2 3 4 5 6). Please circle one number for each statement. PLEASE DO NOT SKIP ANY STATEMENT.

There are no right or wrong answers to any of these questions.

		STRONGLY DISAGREE	DISAGREE	SLIGHTLY DISAGREE	SLIGHTLY AGREE	AGREE	STRONGLY AGREE
1.	If mankind is going to survive at all, environmental pollution must be stopped	1	2	3	4	5	6
2.	People should use less detergent than the manufacturer recommends to help preserve water quality	1	2	3	4	5	6
3.	The news media have exaggerated the ecological problem	1	2	3	4	5	6
4.	Putting a brick in one's toilet to conserve water is a dumb idea	1	2	3	4	5	6
5.	Overpopulation is a major source of environmental problems today	1	2	3	4	5	6
6.	It seems like a waste of time to try to conserve electricity by turning off unneeded lights around the house	1	2	3	4	5	6
7.	People with new cars should use low-lead gas	1	2	3	4	5	6
8.	People should buy (and return) beverages only in returnable containers	1	2	3	4	5	6

(Continued on other side)

		STRONGLY DISAGREE	DISAGREE	SLIGHTLY DISAGREE	SLIGHTLY AGREE	AGREE	STRONGLY AGREE
9.	I am worried about future children's chances of living in a clean environment	1	2	3	4	5	6
10.	Having a lot of money may not bring you happiness, but it sure helps	1	2	3	4	5	6
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12.	Although polluted environments may smell bad or be unsightly, they are usually not dangerous or harmful to health	1	2	3	4	5	6
13.	Every couple in America should try not to have more than two children	1	2	3	4	5	6
14.	It seems silly to attempt to conserve natural resources by running only <u>full</u> loads in dishwashers, and clothes-washers and dryers	1	2	3	4	5	6
15.	I enjoy taking long walks	1	2	3	4	5	6
16.	Personally, I would rather have astroturf than real grass in my front lawn	1	2	3	4	5	6
17.	People should recycle used glass and paper	1	2	3	4	5	6
18.	We shouldn't worry about environmental problems because science and technology will solve them before very long	1	2	3	4	5	6
19.	I wish I could spend more time out-of-doors	1	2	3	4	5	6
20.	All endangered species of animals should be protected so that they won't become extinct	1	2	3	4	5	6
21.	I would like to be a millionaire	1	2	3	4	5	6
22.	If possible, one should join or support financially an ecology center or action group to help solve the environmental crisis	1	2	3	4	5	6
23.	I don't mind seeing billboards when I drive along highways	1	2	3	4	5	6
24.	The solution to pollution starts in the home	1	2	3	4	5	6
25.	There is nothing wrong with using electric can openers, electric pencil sharpeners, and electric manicure sets	1	2	3	4	5	6
26.	Leaves and food scraps should be composted whenever possible	1	2	3	4	5	6

Note.--The foregoing questionnaire was given to subjects in the prod conditions. Forms for subjects in the no-prod conditions did not contain the Miscellaneous section. Forms for subjects in the control condition did not contain the Eco-Action Newsletter and Miscellaneous sections.

APPENDIX H

Q-SORT RATING PROCEDURE

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Q-SORT RATING PROCEDURE

Manual for Prod Call Raters

Background

In the prod call process, a person was telephoned about the Eco-Action Newsletter by the principal investigator, who represented himself as a staff member of the Michigan Student Environmental Confederation calling in regards to the newsletter. After establishing that the person had been receiving the newsletter, the person was asked if she had read the newsletter. If she had not been reading the newsletter, her response was recorded. If she had been reading the newsletter, she was asked if she had been following any of the suggestions set forth in the newsletter (such as, in the first prod, recycling glass and paper, or putting a brick in the toilet to conserve water; or in the second prod such as measuring out and cutting down on the amount of detergent used or using low-lead gas). Her response to this question was then recorded.

Thus, for each person in the study who received a prod call treatment, she received two prod calls and her responses to the question about following the suggestions were recorded for each call.

Purpose of the Rating

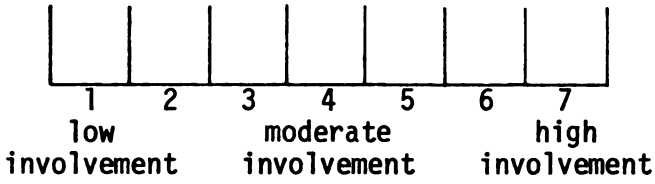
The purpose of the rating task is for you to rate people's responses on the basis of how generally involved you think the person is in environmental action as defined by the activities measured on the Current Activities scale. This involvement should be rated relative to other responses made by other people and should be made as if you were to measure involvement two weeks after the statements were made.

For example, a person who recycles glass and paper and has put a brick in her toilet, cuts down on detergent use, and puts low-lead gas in the car is highly involved in environmental action. A person who doesn't do any of these things is not involved, or involved to a low degree in environmental action.

Sometimes you may have to rely on indirect information to make your rating. For example, a person who simply says that she hasn't read it but plans to as soon as she has the time because she is "all for cleaning up the environment." Or, you may have to look at a person's general interest in, or subjective reaction to the newsletter to help you make a rating. For example, a person who likes the newsletter and says she takes it to a church group to be read might be more involved in environmental action than one who just says the newsletter is somewhat informative. You should be careful not to let sheer amount of verbal information in the response dictate what rating you assign it. Some persons gave a long response that dealt mainly with subjects which were unrelated to environmental action.

Guidelines and Instructions
for Raters

As a guideline for making ratings, there are categories which you can use to assign to a response. These categories form a continuum ranging from 1 (low involvement) to 7 (high involvement). The midpoint of the range, 4, indicates moderate involvement. To illustrate, the rating scale might be thought of as a seven-point continuum as shown below:



To assign a rating to a response, simply put the strip of paper with the response typed on it onto one of the seven sheets of paper representing the seven categories. Use whichever of the seven categories you feel is appropriate to the environmental action involvement indicated by the response. You will not know whether the response comes from the first prod call or the second prod call made to a person. Also, you will not know who the person is or what her group affiliation is, when you rate her response.

Read through all the slips of paper given you before making any ratings, then make each rating one at a time and place the slip into the appropriate category (i.e., onto the appropriate piece of paper).

Below are some examples of extreme and moderate responses with their ratings written in ink to the left of the typed response.

7 "I've been doing them. I use low lead gas and avoid enzyme pre-soaks, and have cut down on the amount of detergent I use. My husband and I both read them (the newsletters). They're very interesting."

4 "I've been reading them. I do recycle paper but not glass. The newsletters are very interesting."

1 "I haven't read them."

APPENDIX I

CODING KEY FOR VARIABLES USED IN THE EXPERIMENT

APPENDIX I

CODING KEY FOR VARIABLES USED IN THE EXPERIMENT

Questionnaire Number	Variable	Scoring Method
	1. Questionnaire 1--Current Activities	
1	Recycling paper	Score response as is (1 = 1, 2 = 2, etc.)
2	Recycling glass	" " "
3	Composting	" " "
4	Avoid using unnecessary electrical appliances	Subtract response value from 7 (e.g., 1 = 6, 2 = 5, etc.)
5	Avoid using enzyme pre-soaks	" " "
6	Avoid plastic-wrapped food products	Score response as is (1 = 1, 2 = 2, etc.)
7	Use less detergent than manufacturer recommends	" " "
8	Using measuring device for detergents	" " "
9	(NOT USED)	
10	Use low-lead gas	" " "
11	Buy returnable bottles	" " "
12	(NOT USED)	
13	Run only full loads in washers and dryers	" " "
14	Put a brick in toilet	1 = yes 0 = no
15	(NOT USED)	
16	(NOT USED)	
17	(NOT USED)	
18	Switched to fluorescent lighting	1 = yes 0 = no
19	Number of other activities listed	Score = number of activities listed which appeared in the newsletter

APPENDIX I. (Continued)

Questionnaire Number	Variable	Scoring Method
	2. Questionnaire 2--Eco-Action Newsletter	
1	Perception of newsletter as interesting	1 = a, 2 = b, etc.
2	Perception of newsletter suggestions as helpful	" "
3	Number of types of people who read subject's newsletter	Score = number of response categories circled
4	Number of types of person subject talked to about newsletter	" " "
5	(NOT USED)	
6	Number of people subject wanted newsletter copies sent to	Score = number of people listed
	2. Questionnaire 2--Miscellaneous	
a	Perception of prod contact as interesting	Score response as is (1 = 1, 2 = 2, etc.)
b	Perception of prod contact as helpful	" " "
c	Perception of prod contact as sincere	" " "
d	Perception of prod contact as uninformative	" " "
e	Perception of prod contact as annoying	" " "
f	Perception of prod contact as unfriendly	" " "

APPENDIX I. (Continued)

Questionnaire Number	Variable	Scoring Method
	2. Questionnaire 2--Current Outlook Survey	
1	Sex	1 = Male 0 = Female
2	Marital status	1 = Married 0 = Single
2	Number of children	Score = Number of children
3	Age	Subtract last two digits of year born from 73
4	Occupation (subject and spouse)	1 = Some occupation 0 = No occupation
4	Occupational prestige status	Score occupation on Duncan's (1961) Socio-economic Status Scale (e.g., secretary = 61; teacher = 72)
5	Religious affiliation	1 = Protestant, Catholic, Jewish, or other 0 = None
6	Number of siblings	Score = Number of brothers + sisters
7	(NOT USED)	
8	Level of educational achievement	1 = a, 2 = b, etc.
9	Level of household income	" "
10	Number of days spent on vacation trips	" "
11	Number of hours spent out-of-doors on a typical day in current month	" "
12	Number of cars in household	Score = Number of cars in household
13	Number of other motorized vehicles in household	Score = Number of other motorized vehicles in household
14	Number of household subscriptions	Score = Number of titles listed
15	(NOT USED)	
16	Number of years lived in Ingham County	1 = a, 2 = b, etc.
17	Number of years lived at current address	" "

APPENDIX I. (Continued)

Questionnaire Number	Variable	Scoring Method
	2. Questionnaire 2--Current Outlook Survey (Continued)	
18	(NOT USED)	
19	(NOT USED)	
20	(NOT USED	
	2. Questionnaire 2--Attitudes Toward Current Issues (Subject's and Spouse's Forms)	
	All 26 items	Score responses as is (1 = 1, 2 = 2, etc.)

Note.--Non-responses for all questionnaire items were coded as blanks (i.e., missing data).

APPENDIX J

SCORING PROCEDURES FOR ENVIRONMENTAL ATTITUDE MEASURES

APPENDIX J

SCORING PROCEDURES FOR ENVIRONMENTAL ATTITUDE MEASURES

For each subject and her spouse, composite factor scores for concern for environmental quality and concern for environmental action were compiled by using the following sets of items from the Current Outlook Survey section of the second questionnaire. In each case, the composite score consisted of the sum of simple z-scores for each item (cf., Ghiselli, 1964). Items preceded by (R) indicate those items for which the score value was subtracted from 7 (i.e., reversed) before forming z-scores.

Concern for Environmental Quality

Questionnaire Number	Item
1 (R)	If mankind is going to survive at all, environmental pollution must be stopped.
3	The news media have exaggerated the ecological problem.
9 (R)	I am worried about future children's chances of living in a clean environment.
12	Although polluted environments may smell bad or be unsightly, they are usually not dangerous or harmful to health.
18	We shouldn't worry about environmental problems because science and technology will solve them before very long.

Concern for Environmental Action	
Questionnaire Number	Item
2	People should use less detergent than the manufacturer recommends to help preserve water quality.
4 (R)	Putting a brick in one's toilet to conserve water is a dumb idea.
7	People with new cars should use low-lead gas.
8	People should buy (and return) beverages only in returnable containers.
11	People should avoid buying unnecessary plastic packaging found in such food products as individually wrapped (slices) cheese and frozen food in cooking pouches.
25 (R)	There is nothing wrong with using electric can openers, electric pencil sharpeners, and electric manicure sets.

APPENDIX K

PERCENTAGE OF SUBJECTS BY RESPONSE CATEGORY FOR ENVIRONMENTAL ACTION MEASURES ACROSS ALL CONDITIONS

APPENDIX K

PERCENTAGE OF SUBJECTS BY RESPONSE CATEGORY FOR ENVIRONMENTAL ACTION MEASURES ACROSS ALL CONDITIONS

Environmental Action Measure	Response Category										
	0	1	2	3	4	5	6	7	8	9	10
CA1 Recycling paper	NA	45	10	12	6	9	17	NA	NA	NA	NA
CA 2 Recycling glass	NA	46	10	8	9	6	20	NA	NA	NA	NA
CA 3 Composting	NA	52	5	13	4	11	15	NA	NA	NA	NA
CA 4 Avoid using unnecessary electrical appliances	NA	22	11	14	15	24	14	NA	NA	NA	NA
CA 5 Avoid using enzyme pre-soaks	NA	10	4	4	9	13	60	NA	NA	NA	NA
CA 6 Avoid plastic-wrapped food products	NA	16	16	22	11	23	12	NA	NA	NA	NA
CA 7 Using less detergent than the manufacturer recommends	NA	14	5	11	7	19	45	NA	NA	NA	NA

APPENDIX K. (Continued)

Environmental Action Measure	Response Category										
	0	1	2	3	4	5	6	7	8	9	10
CA 8 Using a measuring device for detergents	NA	13	0	2	1	7	77	NA	NA	NA	NA
CA 10 Using low-lead gas in car	67	6	1	2	2	6	1	1	1	6	9
CA 11 Buying returnable bottles	18	10	7	4	3	20	1	3	5	13	15
CA 13 Running only full loads in washers and dryers	1	1	3	1	0	9	2	1	7	29	46
CA 14 Put brick in toilet	88	12	NA	NA	NA	NA	NA	NA	NA	NA	NA
CA 19 Number of other activities	78	13	5	2	1	0	0	0	0	0	1

NA = Not applicable

Note.--The values in each category represent the percentage of subjects answering the item who responded in that category.

Owing to rounding, the sum of percentages for any item may add up to slightly less than or more than 100.

APPENDIX L

CORRELATES BETWEEN ENVIRONMENTAL ACTION AND DIFFUSION MEASURES

APPENDIX L

CORRELATES BETWEEN ENVIRONMENTAL ACTION AND DIFFUSION MEASURES

Environmental Action Measure	Diffusion Measure		
	Number of types of other people who read the subject's news-letter	Number of types of other people who subject talked with about the newsletter	Number of other people subject wanted newsletter sent to
CA 1 Recycling paper	.02	.28**	.07
CA 2 Recycling glass	.02	.28**	-.04
CA 3 Composting	.06	.06	.11
CA 4 Avoid using unnecessary electrical appliances	.03	.24*	.17
CA 5 Avoid using enzyme pre-soaks	-.26*	-.11	.05
CA 6 Avoid plastic-wrapped food products	.07	.26*	.24*
CA 7 Using less detergent than the manufacturer recommends	.16	.28**	.13

APPENDIX L. (Continued)

Environmental Action Measure	Diffusion Measure		
	Number of types of other people who read the subject's newsletter	Number of types of other people who subject talked with about the newsletter	Number of other people subject wanted newsletter sent to
CA 8 Using a measuring device for detergents	-.09	.09	.05
CA 10 Using low-lead gas in car	.15	-.02	-.03
CA 11 Buying returnable bottles	.11	.11	.04
CA 13 Running only full loads in washers and dryers	.03	.07	.05
CA 14 Put brick in toilet	.17	.19	.18
CA 18 Switched to fluorescent lighting	.35**	.22**	.11
CA 19 Number of other activities	.18	.33**	.01

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

Note.--Correlations were computed using all subjects who filled out the first questionnaire.