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# **THE ECOTEAM PROGRAM IN THE NETHERLANDS**

**Study 4: A longitudinal study on the effects of the Eco Team program on  
environmental behavior and its psychological backgrounds**

**Summary report**

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E&M/R-95/57

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## **Preface**

In this report the results are presented of a two-year study on the effectiveness of the Eco Team Program, an action program to improve pro-environmental behavior in the household. In a longitudinal design changes in household behavior and their psychological backgrounds have been investigated, as well as the quantitative savings of environmental resources that result from behavior change. Side- and aftereffects of the program have also been investigated. The study has been carried out with financial support from the Ministry of the Environment.

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- The participants of the Eco Team Program who have been patient enough to provide us with the enormous amount of data we deemed necessary to obtain insight in the effects of the Eco Team Program.

Leiden, October 1995

Henk Staats  
Paul Harland

Centre for Energy and Environmental Research  
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## CHAPTER 1: INTRODUCTION

Global Action Plan for the Earth is an international environmental organisation that distributes the EcoTeam Program, a specific action program to improve ecologically relevant behavior within households. The EcoTeam Program (ETP) is new. Therefore it raises a number of questions, the most important of which is how effective the program is in changing behavior. This question is addressed in this report.

Effectiveness of an intervention program is not a unitary concept but has several dimensions: De Young (1993) mentions five. Effectiveness is specified as *reliability*, the ability of the technique to change the behavior of those targeted; *speed*, the time it takes the technique to change behavior; *particularism*, the degree to which the technique is universally applicable or has to be designed differently for subgroups or, at the extreme, for individuals; *generality*, the ability to change behavior that is not the direct target of the intervention but is conceptually related; and *durability*, the persistence of changes when the intervention has stopped. This set of dimensions will be used as a framework to evaluate the results of this study.

In the following sections a description will be given of the ETP (1.1), its psychological characteristics and some expectations about its effects, based on previous research on intervention techniques (1.2) and the main research questions (1.3). Chapter 2 describes the design of the study and Chapter 3 portrays the behavioral effects of participation in the ETP directly after concluding the program and six to nine month afterwards. In Chapter 4 the changes are described in four household variables that have direct consequences for the environment, i.e., the production of waste and the consumption of gas, water and electricity. These effects have been measured directly after participants concluded the program and six to nine months thereafter. Chapter 5 goes into detail in studying one form of behavior. Insight in the psychological mechanisms that underlie behavior allow better understanding of the reasons of change and will be helpful in clarifying the prediction of future behavior. After an explanation of the theoretical model that underlies the analysis, developments in behavior and its psychological backgrounds are tracked over time. In Chapter 6 the side- and aftereffects of the program on activities that were not directly targeted, are described, in Chapter 7 the evaluations of the EcoTeam Program by the participants. Conclusions about the effectiveness of the EcoTeam Program are drawn in Chapter 8. The main results of participation are reviewed, structured by the five dimensions of effectiveness that are described above. Finally some recommendations are given concerning the structure and dissemination of the program, and some possibilities for future research are offered.



## **1.1 Global Action Plan and the EcoTeam Program**

Global Action Plan for the Earth (GAP) is an environmental-action organisation, aimed at the preservation of the environment on earth. It was founded in 1990 by an international group of behavioral and environmental scientists. In 1991 GAP became active in the Netherlands, and by the end of 1994, it had spread to 14 countries.

GAP has set environmental goals for the year 2000 and converted these to quantitative goals applicable to households. Household goals are a 65% reduction of waste disposal, a 30% reduction of electricity, natural gas and water use, and a 40% reduction of fuel consumption for transport. These reductions would lead to a carbon dioxide emission that is 30% less than it is now. These goals meet the targets set by the Dutch government for the year 2000 and in some cases exceed them.

GAP's main assumption is that many people want to help create a better environment, but they often do not know where to start. Furthermore, people hold the opinion that on the whole their individual effort will be negligible. These are the people GAP wants to target for involvement.

The EcoTeam Program is aimed at behavioral change. It consists of three parts which are described below.

### *The EcoTeam*

GAP sets up EcoTeams: small groups of 6 to 10 neighbours, friends, club members, church members etc.. These groups of people, representatives of their households, meet once a month. During these meetings experiences, ideas and achievements related to the EcoTeam Program are discussed. Following the EcoTeam Workbook, the EcoTeams subsequently concentrate on each of the following six themes for four consecutive weeks: garbage, gas, electricity, water, transport and consumption. The program lasts approximately 8 months. Each team is supported by a coach or by the report centre.

### *Information*

EcoTeam members are provided with a personal Workbook and a logbook in which Team results are recorded. The EcoTeam Workbook includes a short introduction to each of the six themes mentioned above, followed by an explanation of the goals GAP pursues. Thereafter comes a listing of a large number of pro-environmental actions that can be undertaken in the household. The Workbook contains a questionnaire which enables the individual team members to check their progress in terms of environmental actions. In addition are the Team results in terms of savings of gas, energy, waste reduction etc. recorded in the Team logbook. In this way the Team members gain

insight into their own behavior with regard to the six mentioned themes, and track their progress, individually as well as on the Team level.

### *The feedback system*

In each EcoTeam the group-results are recorded and sent to a central database at the national GAP office in the Hague. In this way, the results of all active EcoTeams in the Netherlands are compiled and individual teams can receive feedback about the amount of realised savings. The Dutch EcoTeams also receive feedback about the accumulated results of all EcoTeams in the Netherlands and in other countries by means of the 'EcoTeam-Newsletter', which is distributed every three months. Through the Newsletter the teams will gain feedback, giving them insight into the growth of the EcoTeam Program and into its numerical results.

## **1.2 Psychological characteristics of the ETP and expectations about its effectiveness based on previous research**

What do we know about the three elements of the ETP from previous research in environmental psychology? Two of these, information and feedback have been studied quite often during the last decades. Working in a group that has organized itself to discuss and ameliorate its own environmentally relevant behavior has never before been attempted, so no specific knowledge on this topic is available, although some of the psychological mechanisms inherent in this approach have been studied before. This description will end in a presentation of a model of empowerment as recently conceived.

*Information* is one of the most widely used means to bring about changes. Information can be given on a scale ranging from mass media campaigns to close personal friends. Mass media information campaigns, as commonly employed by the government, usually do not directly influence behavior but may be helpful in putting an item on the public agenda (see McGuire, 1985 for an extensive overview or Staats, Midden and Wit, 1995, for a specific application on effects of mass media information about the greenhouse effect). Information will only change behavior directly when the behavior is relatively easy to perform, when it is specified very precisely on a behavioral level, when convenient pro-ecological alternatives are available, when the message is delivered in close proximity to the target behavior and when the message does not constitute a threat to an individual's perceived freedom (Geller, 1989). Given these conditions, more is usually needed than information alone to change behavior. But, information is an important prerequisite for other techniques to build upon. Information is helpful in

increasing problem awareness, in developing a sense of personal responsibility and in giving specific behavioral information. The latter is necessary because attitude changes that lead to behavior change are dependent on the perceived likelihood and evaluation of outcomes of behavior (Fishbein and Ajzen, 1975). Unknown outcomes of environmentally unfriendly behavior have to be pointed out, alternatives have to be indicated. A perceived lack of control to carry out pro-environmental behavior can be reduced by practical information or taken away completely (Ajzen and Madden, 1986). In the ETP both kinds of information are provided by the Workbook. It contains information about backgrounds of environmental problems and points out how individual behavior carried out collectively, leads to the problems mankind is facing now. Also it contains practical advice about how to change behavior with little behavioral costs. Because of the broad scope of the ETP the Workbook is a valuable source of practical information for pro-environmental behavior in the household.

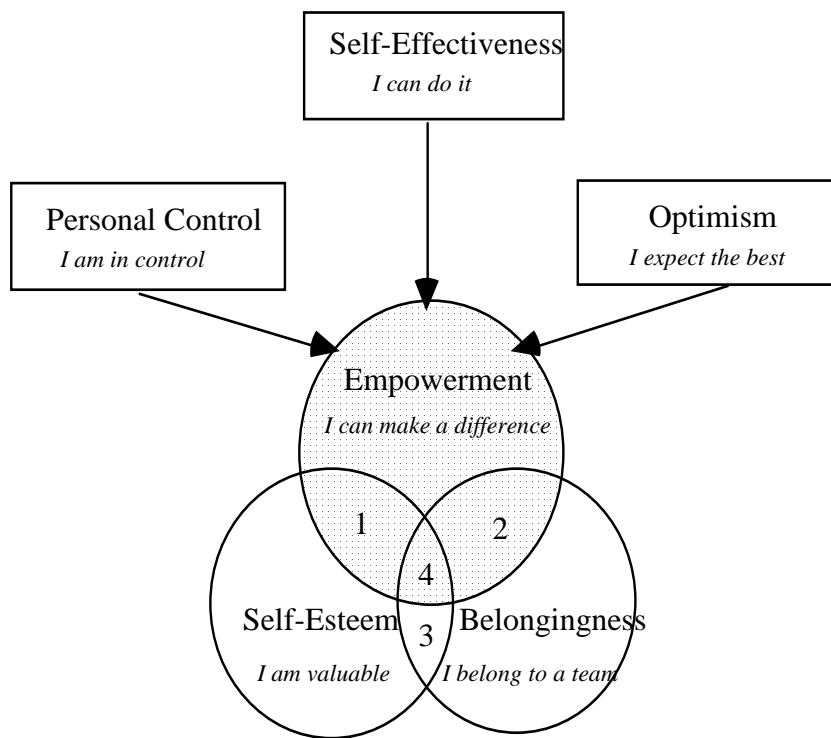
*Feedback.* Apart from information the ETP aims to provide feedback. Feedback is the provision of information about the effects of previously performed behavior in order to be able to adjust behavior. Feedback has to be provided close in time to the performed behavior, in meaningful terms and in comparison to a relevant criterion. Based on the results of an earlier study (Weenig, Gijssman and Langezaal, 1994) the Dutch EcoTeams are provided with feedback that stresses the collective accomplishments of all active EcoTeams. This type of feedback probably increases the sense of individual and collective efficacy (Bandura, 1977). Feedback is provided each month which is reasonably fast and it is based on self registration. Other research has made clear that self registration imposes a barrier for participation but is quite effective for people who are willing to make this effort (De Boer and Ester, 1985). In general, feedback is helpful in changing behavior. A drawback is that usually these effects disappear when feedback is no longer provided (Dwyer et al., 1993). The EcoTeam Newsletter, which is also distributed to former EcoTeam members and contains information about the accomplishments of all EcoTeams, present and past, may therefore be important as an additional source of motivation to persist in the changes that have been realized in the period individuals were active Team members.

*The EcoTeam.* As mentioned before, no experience is available with groups that voluntarily organize themselves to improve environmentally relevant behavior. It is only in other domains that we find organisations that are somewhat similar, like Weight Watchers and Alcoholics Anonymous. The comparison is skewed however, because these groups are based on self interest and not organized out of concern for a societal problem. However, despite the lack of previous experience with the Team phenomenon,

some of the psychological processes that are likely to happen within EcoTeams have been studied extensively and have been identified as powerful mechanisms of change and action. The first of these is *commitment*. EcoTeam members commit themselves to keep appointments with their Team. These appointments refer to attending the EcoTeam meetings, collecting and passing on the environmental household data, discussing experiences and making intentions to change behavior. Commitment is one of few mechanisms that are known to produce behavior changes that last, after the period in which the intervention takes place (De Young, 1993). A second important characteristic is the *social support* that is likely to be received by EcoTeam members. Changing behavior, especially behavioral routines, is difficult and demands, apart from good reasons and specific behavioral information, a social environment that welcomes these changes and is willing to help when practical problems emerge. A third and related effect of working as a Team may be the *reduction of uncertainty*, doubts about efforts that other people are willing to take, are reduced (Wit and Wilke, 1995).

There are however possible drawbacks to working in groups. There is the risk of undue social pressure on Team members to increase their efforts beyond what they are willing to do. An atmosphere of competition to obtain the most spectacular results, within or between teams, may emerge. Also members may feel their privacy threatened if they feel obliged to disclose information about their household they consider personal. A pilot study (Harland, Langezaal, Staats and Weenig, 1993) has indicated that the benefits of working in Teams are likely to be dominant when EcoTeams have organized themselves, while the perceived drawbacks prevail in people not yet engaged in the ETP. The latter finding has been confirmed in a quantitative study on attitudes and intentions towards participation in the ETP (Staats and Herenius, 1995).

*Empowerment*. The goal of the combination of elements of the EcoTeam Program is to empower to take pro-environmental action. Empowerment is described by Geller (1995) as the feeling that one's efforts can make a difference. Empowerment is influenced by optimism, feelings of control and efficacy and enforced by self-esteem and a feeling of belongingness to a team. This model of empowerment is graphically represented in Figure 1.



Legend: 1. I can make valuable differences  
 2. We can make a difference  
 3. I am a valuable team member  
 4. We can make valuable differences

Figure 1. The five person states or expectancies presumed to influence propensity to actively care (Geller, 1995, p.193)

The strongest effects come forth in area 4 where the three circles overlap. Though this representation can not be considered a well developed and thoroughly tested psychological theory, Figure 1 nicely illustrates what the ETP aims to create: a group of people who are empowered to actively care for the environment.

### 1.3 Research questions

In this study six questions are addressed:

- What changes in environmental behavior are caused by participation in the ETP?
- Do these changes persist?
- Are these changes effective in reducing the household environmental burden?
- How are these behavioral changes psychologically explained?
- What side- and aftereffects of participation have occurred?
- How is the ETP evaluated by participants?

## **CHAPTER 2: STUDY DESIGN**

To investigate short and long term behavioral changes and their psychological backgrounds a longitudinal study design is necessary. In this study measurements were taken at three moments in time: directly before participation, directly after completion of the ETP and 6 to 9 months afterwards.

### **2.1 Respondents**

All people who were ready to start the ETP in January or February 1994 received a request to participate in the research. A total of 60 EcoTeams was involved, consisting of 445 participants, 289 of whom (65%) cooperated prior to participation in the ETP, by completing the first set of questionnaires (pre-test). In October 1994, these people were approached for a second time to complete the questionnaires that assessed their environmental behavior, psychological backgrounds and quantitative environmental household savings after participation (first post-test). Of the original sample of 289 respondents, 205 (71%) completed the post-ETP questionnaires. In May 1995 this group was approached again with the request to complete a third set of questionnaires to obtain a similar set of data six to nine months after participation (second post-test).

Table 1 gives demographic and sociographic data of the sample that completed both the pre- and first post-ETP questionnaires. The socio-economic status of the sample is higher than average in the Netherlands, also women are over represented. This high rate of female participants may be due to the fact that participants were recruited for the ETP in that period mainly through a number of women's organizations. The sample of respondents that also completed the second post-ETP questionnaire was reduced to 167, due to a non response of 19%. Non response was neither related to socio-demographic characteristics nor to general environmental concern.

Table 1. Demographic and sociographic characteristics of the sample of the first post-test (percentages, N=205)

	scale	%
Age (years)	24 to 29	3.4
	30 to 39	17.8
	40 to 49	33.1
	50 to 59	25.1
	60 to 69	15.8
	70 and older	4.9
Sex	male	16.6
	female	83.3
Education (highest degree)	primary school	4.7
	secondary school	55.0
	college/university	33.5
	else	6.8
Net yearly income of household (Dutch guilders)	Less than 10.000	1.7
	10.000 to 19.999	5.0
	20.000 to 29.999	10.6
	30.000 to 39.999	17.9
	40.000 to 49.999	18.4
	50.000 to 59.999	18.4
	60.000 to 69.999	11.7
70.000 or more	16.2	
Household size (# persons)	1	16.3
	2	35.0
	3	12.8
	4	23.2
	5	11.3
	6	1.0
	7	0.5

## 2.2 Questionnaires and quantitative environmental household data

### *Before participation in the ETP*

All data was collected through mail questionnaires. For the pre-ETP survey two extensive questionnaires were developed. One consisted of an inventory of all kinds of environmentally relevant household behavior that are mentioned in the Workbook. A total of almost 100 specific behavior was measured ranging from very frequently performed behaviors (e.g., frequency of closing the faucet while brushing your teeth) to one time investments (e.g., installing double glazing for better insulation). The second questionnaire contained the psychological background variables of behavior deemed theoretically relevant. Five kinds of behavior were analysed in this way. A third questionnaire was prepared in which subjects were to register the amount of solid waste they produced (in kilograms), the amount of natural gas, water and electricity they consumed, all over a period of two weeks. Pre-ETP questionnaires and booklet were administered in January 1994.

#### *Directly after participation in the ETP*

In essence the same data was collected directly after participation in the ETP in October 1994. Based on statistical analyses of the pre-ETP data, a number of redundant items was left out. Also, the number of behaviors that were psychologically analyzed in detail was reduced from five to three, to make the task of completing the questionnaires not overly taxing. However, the created space was partially used to ask a number of questions about the participants' experiences with the ETP. Again, quantitative data on the amount of solid waste disposed of and the amount of natural gas, water and electricity consumed during a two-week span was collected.

#### *Long after participation in the ETP*

In May 1995, six to nine months after concluding the ETP, former participants were again requested to complete a questionnaire and measure the amount of solid waste produced and the amount of water and electricity consumed. Because of the season, late spring, no data on natural gas consumption, was collected. The number of questions in the questionnaire was again reduced and some of the obtained space was used to measure side- and aftereffects of participation in domains other than the household.

#### *Control group*

As will be clear from this description, the amount of information requested far exceeded what is considered feasible for mail surveys (Dillman, 1978). Therefore no attempt was made to gather the same data from a control group. Instead, a series of 11 kinds of behavior and a general measure of environmental concern were measured in the same way as is done in a longitudinal survey on environmental household behavior. This survey is administered each year among a representative sample of the Dutch population (De Kruijk and Couvret, 1994, 1995). Data collection for this yearly survey was done both times within one month of the collection of pre- and first post-ETP data among the ETP participants. Comparison of the 11 kinds of behavior and general environmental concern in both samples was deemed adequate to assess if the changes ascertained in the ETP participants were caused by the ETP or were part of changes that occurred in the whole Dutch population.



## **CHAPTER 3: SHORT AND LONGER TERM CHANGES IN ENVIRONMENTALLY RELEVANT HOUSEHOLD BEHAVIOR**

In this chapter the changes in environmentally relevant household behavior will be described. First, short term behavioral changes among the ETP participants will be described. A selection of these behaviors will be compared to developments in behavior among the Dutch population in the same period. Thereafter the question of how these behaviors changed in the longer term, will be addressed.

### **3.1 Short term behavioral changes**

To compare changes in environmentally relevant household behavior 93 questions on specific behaviors were asked in the pre-ETP questionnaire and in the first post-ETP questionnaire. Each of the six environmental domains distinguished in the Workbook (waste, natural gas, water, electricity, transportation and consumer goods) was represented by a series of relevant behaviors. On a psychological level the whole set of behaviors can be distinguished in their frequency of occurrence and, in the case of investments, in the amount of money involved. Changes in behavior will be described by environmental domain and summarized in terms of psychological characteristics.

*Waste.* Three out of four behaviors related to the production of waste changed: an increase in the separation of organic waste, of old textile products and of chemical waste was ascertained. The number of people who composted organic waste at home was unchanged.

*Natural gas.* Two out of 13 behaviors changed. The placement of furniture in relation to the sources of heat was changed to improve heating efficiency and the thermostats had been checked to insure their proper functioning. The other 11 behaviors, related to several forms of isolation and the buying of a more efficient central heating installation, remained unchanged.

*Electricity.* Eight of 15 behaviors changed. Turning off lights in unoccupied rooms, switching off the television set instead of having it on standby, using the washing machine only when it is fully loaded, cooking as efficiently as possible were daily behaviors that changed. Energy efficient lights were installed by a larger number of people and in greater amounts. The same was ascertained for the installation of time switches on electric devices for more efficient use.

*Water.* Of 18 possible behaviors 10 changed. Three of these, leaving the faucet running while washing hands, washing the dishes and brushing teeth, were improved. Also shower time and the frequency of washing the car were both reduced. ETP participants also made four small investments in water saving devices for their faucets, toilets and showerheads. Finally, a significant number of leaking faucets had been repaired.

*Transportation.* Five of 17 behaviors changed. More cars with catalytic converter were in use after the ETP, average speed on highways was reduced and for distances up to five kilometers, the use of public transportation and the car had decreased while the use of the bicycle had increased.

*Consumption.* Out of a series of 26 items participants had improved on 18. Of these behavioral changes eight referred to food consumption, five to the use of cleaning products, two to the kind of paper that is used, one to refusing plastic bags in shops and two to repairing products instead of buying new ones.

The changes are summarized in Table 2. The table makes clear that directly after participation in the ETP many frequently performed behaviors have changed, while little behavior that involves a one time effort changed. Also many small investments were made while large investments were not.

Table 2. Type and number of changed and unchanged environmentally relevant behavior directly after participation in the ETP (absolute numbers)

	changed	unchanged	total
Frequently occurring	36	27	63
One time behavior	2	8	10
Small investments	8	6	14
Large investments	0	6	6
<b>TOTAL</b>	<b>46</b>	<b>47</b>	<b>93</b>

### 3.2 Behavior of EcoTeam participants compared to the Dutch population

The changes in behavior of EcoTeam participants may have been caused by the EcoTeam Program. However, the possibility exists that the ascertained behavior change is part of a national trend and caused by other factors, like nation wide information campaigns, new infrastructure that facilitates pro-environmental behavior etc. To be able to attribute the cause of the behavioral changes, EcoTeam participants were compared with a sample of the Dutch population. 11 behaviors measured in national surveys in the same periods as the pre- and post-questionnaires among EcoTeam

participants formed the basis for this comparison. Table 3 and 4 show the changes in pro-environmental behavior in both groups.

Changes in frequently performed behavior (Table 3) appear to differ markedly between the Dutch population and the EcoTeam participants. Among the Dutch population four behaviors remained unchanged, three became less favorable for the environment and two improved. Among the EcoTeam participants eight out of these nine behaviors became more pro-environmental, while only one remained unchanged. The comparison makes clear that the ETP can be considered the cause of the strong effects among participants as the Dutch population overall has not improved its behavior.

Table 3. Changes in nine frequently occurring pro-environmental behaviors among EcoTeam participants and the Dutch population (N EcoTeam participants =205, N Dutch population =1500, means and significance levels, 1=never, 7=always)

	Dutch population EcoTeams			
	nov.94	nov. 95	before	after ETP
using unbleached toilet paper	3.91	3.88 <sup>ns</sup>	4.97	5.32*
buying refillable detergents	3.54	4.41***	4.28	5.14***
using unbleached writing paper	3.91	3.19*** (-)	3.57	4.30***
separating organic waste	4.55	5.30***	5.56	6.35***
washing clothing only with a fully loaded machine	6.04	5.88*** (-)	6.13	6.31**
turning of the faucet while doing the dishes	5.66	5.90 <sup>ns</sup>	5.87	6.11*
refusing plastic shopping bags	3.98	4.04 <sup>ns</sup>	5.00	6.42***
bringing your own shopping bag	6.24	6.20 <sup>ns</sup>	6.55	6.66 <sup>ns</sup>
not using detergents that contain chloride	4.78	4.58*** (-)	5.50	5.91***

(ns=not significant, \*=p<.05, \*\*=p<.01, \*\*\*=p<.001)

A slightly different picture emerges from Table 4. EcoTeam participants installed water saving shower heads at a pace not matched by the Dutch population, while the Dutch population appears to have almost caught up with the installation of energy saving lamps. On the last item, the increase among the Dutch population is greater although EcoTeam participants remained in advance.

Table 4. Small investments in water saving showerheads and energy saving lamps. EcoTeam participants compared to the Dutch population (N EcoTeam participants =205, N Dutch population =1500 )

	Dutch population EcoTeams			
	nov.94	nov. 95	before	after ETP
Installation of water saving showerheads	31%	45%	36%	55%
Installation of energy saving lamps	26%	68%	71%	80%

Overall, the Dutch population has become more environmentally friendly on 4 out of 11 forms of behavior but has worsened on 3, while EcoTeam participants have improved

on 10 out of 11 types of behavior. This warrants the *conclusion* that mainly the EcoTeam Program is likely to have caused the behavioral pro-environmental changes among participants that have been reported in this and the previous paragraph.

### **3.3 Longer term behavioral changes**

Six to nine months after participants completed the EcoTeam Program they were again requested to report on their behavior. With this part of the study the extremely important question of persistence of behavior changes was addressed. Research on long term effects of intervention techniques is scarce. The few studies of continuation of effects some time after the removal of the intervention have concluded that durability is the exception rather than the rule. An urgent need exists for intervention techniques that produce lasting changes (De Young, 1993; Dwyer et al., 1993). For the second post-ETP measurement a selection was made of 43 behaviors of the original 93 to see how EcoTeam participants performed six to nine months after finishing the ETP. These 43 were sampled over the six environmental domains and included 23 behaviors that had changed and 20 that had not changed directly after the ETP (including all 93 behaviors would most probably have caused a large non-response because of the great burden that was already placed on participants in the study). With this selection all possible patterns of behavior change could be detected. In this second post-test 169 former EcoTeam participants completed the questionnaire, a non-response of 19% compared to the first post-test. No significant differences in socio-demographic characteristics or general environmental concern were found between these samples.

*Waste.* The positive change in disposal of old textile proved to have been maintained. Turning organic waste into compost, previously unchanged, has remained unchanged on a longer term.

*Natural gas.* The isolation of radiators in the central heating system, previously changed, has remained so. Installation of double glazing, previously unchanged, has been done by a significant number of former participants six to nine months after participation.

*Electricity.* Four improvements in behavior related to the consumption of electricity directly after the ETP have been maintained or have improved even further. The change in switching off the television set instead of having it in standby position has been maintained while the selective use of the washing machine only when fully loaded has even further improved. The increased number of people using energy efficient lamps has remained while an even larger average number of energy efficient lamps has been installed by this group, compared to the time directly after participation. The two items

that were unchanged directly after the ETP, energy source of the water boiler and water temperature of the boiler, remained unchanged.

*Water.* All seven behaviors, changed directly after the ETP, were maintained. Shower time remained reduced and turning off the faucet while washing hands and brushing teeth is still practiced with the same frequency as directly after the ETP. Small environmental alterations, the installation of water saving devices on faucets, toilets and showers have remained in place. In two cases improvements have even increased. More ex-participants installed a water saving shower head or a water saving device in their toilets than directly after the ETP. Also the frequency of taking a bath, that was unchanged directly after the ETP, has been reduced six to nine months later.

*Transportation.* Changes on two types of behavior have been maintained. The number of cars with catalytic converters has remained increased and the frequency of choosing other means of transportation than the car for distances below 5 km. has remained increased. Of the ten types of behavior that were previously unchanged, 8 have remained unchanged. Two have improved some time after participation. More people take the bike for distances under 5 km. and more people have started car-pooling.

*Consumption.* Seven out of eight behavior changes have been maintained. Buying organically grown food and food that is frozen or canned and also the frequency and weight of meat that is consumed daily, have remained changed. In addition the use of unbleached writing paper and the refusal to accept plastic bags in shops have remained changed. The frequency of bringing a shopping bag from home has fallen back to the level prior to the ETP. Of two behaviors that had not changed directly after the ETP the use of unbleached filter bags for making coffee has increased later, while the use of unbleached toilet paper has remained the same.

*Conclusion.* The description of developments in behavior six to nine months after concluding the ETP makes clear that, with one exception, all behavioral changes have been maintained or even increased further. In addition four of 20 previously unchanged behaviors have improved in this period. The results of this chapter are summarized in Table 5.

Table 5. Developments in behavior investigated before, directly after and 6 to 9 months after the ETP

Comparison between situation before and directly after the ETP	Comparison between situation before and 6 to 9 months after ETP	Comparison between situation directly and 6 to 9 months after ETP
23 behaviors have improved	22 improvements have been maintained	4 behaviors have improved further
	1 behavior has returned to pre-ETP level	
20 behaviors have not changed	16 behaviors have remained unchanged	
	4 behaviors have improved still	

**CHAPTER 4: SHORT AND LONGER TERM CHANGES IN QUANTITATIVE ENVIRONMENTAL SAVINGS OF THE HOUSEHOLD**

Improvement of pro-environmental behavior is a very valuable result of the ETP. Nevertheless, the ultimate results of the Program should be expressed in parameters that express the environmental resources that are saved as directly as possible. The parameters used in this study are the consumption of gas, electricity and water and the production of waste. Quantitative data on these four themes have been collected together with the questionnaires before (T0), directly after (T1) and six to nine months after participation (T2) . The subjects were asked to keep record of their use of gas, electricity and water and the weight of solid waste they disposed, each time during a two-week span. The comparisons between the three measurement periods will be presented in this chapter. First, the pre-ETP and first post-ETP comparisons will be presented. Next the comparisons will be given for the group that also completed the forms the second post-ETP forms. Because a number of forms that were returned proved to be inconsistent or incomplete, the numbers of participants differ for each environmental theme. The number of respondents that provided data for analyses on the second post-ETP survey has decreased in general.

**4.1 Comparisons on four quantitative environmental household savings before and directly after participation.**

In Table 6 quantitative results are given for waste, gas, electricity and water. All data is presented as average daily consumption (for waste, production) per household member. The data clearly indicate that substantial savings have been achieved. The weight of waste produced and the amount of natural gas consumed show the most striking effects. Savings of electricity and water are more modest but significant.

Table 6 Comparison of environmental effects before and shortly after participation in the ETP. Presented are averages and standard deviations (between brackets), the percentage difference (N= the number of persons available for statistical analysis)

	Consumption prior to participation	Consumption directly after participation	Savings (in %)	N
Waste (kilograms per person per day)	.31 (.27)	.22 (.22)***	27.6%	92
Gas (M <sup>3</sup> per person per degree day)	.32 (.19)	.24 (.18)***	23.1%	144
Electricity (kwh per person per week)	27.7 (15.7)	25.8 (15.2)*	6.8%	153
Water (M <sup>3</sup> per person per week)	.89 (.40)	.84 (.39)*	4.9%	132

(\*= $p < .05$ , \*\*= $p < .01$ , \*\*\*= $p < .001$ )

#### 4.2 Comparison of four environmental savings before, directly after and six to nine months after participation.

The same analysis has been performed on the data obtained six to nine months after participation in the ETP. Due to the season, late spring, no data on the consumption of gas could be collected. The results for the other three environmental themes are presented in Table 7. The Table indicates that for two of the three domains savings were not only maintained but were increased. Percentages of savings for waste and use of electricity during the last two-week period are higher than they were immediately after participation. Some of the behavioral changes that have occurred in the period after participation appear to have caused savings in waste and electricity to increase further. This pattern does not apply for water use. Use of water has, in fact, remained at the level before participation. Explanations about this phenomenon can only be speculative because it is not in line with the behavioral changes reported in the preceding chapter. One possible reason is the weather in April and May 1995 which was warm and dry. This may have caused participants to water their gardens. This was most probably was not necessary in the previous two measurement periods.

Table 7 A comparison of environmental effects before, directly after and six to nine months after participation in the ETP. Presented are averages and standard deviations (between brackets), the difference in percentage points between the pre-ETP data and the second post-ETP data (N=the number of persons available for statistical analysis)

	Consumption prior to ETP	Consumption directly after participation	Consumption 6-9 months after ETP	Savings (in %)	N
Waste (kilograms p.p. per day)	.28 (.27)	.18 (.17)***	.17 (.12)**	39.0%	49
Electricity (kwh p.p. per week)	27.7 (15.7)	27.4 (16.6) ns	21.0 (13.1)***	27.2%	93
Water (M <sup>3</sup> p.p. per week)	.86 (.37)	.81 (.36)ns	.89 (.40) ns	- 3.0%	82

(\* = p < .05, \*\* = p < .01, \*\*\* = p < .001, ns = no significant change)

Overall, the *conclusion* of this chapter is that EcoTeam participants have been successful in reducing their consumption of environmental resources. Again, as in the previous chapter, success of their efforts is not only apparent directly after finishing the ETP, but is maintained and even improved on a longer term in two of three environmental themes.

## **CHAPTER 5: A PSYCHOLOGICAL EXPLANATION OF PRO-ENVIRONMENTAL BEHAVIOR**

As is previously concluded, the changes in pro-environmental behavior can be attributed to participation in the ETP. Nevertheless, an analysis that provides deeper insight into the psychological mechanisms that have been triggered and changed will be helpful for a better understanding the effects of the Program and for making valid predictions on the development of this behavior after participants have finished the ETP. Such an analysis is provided in this chapter for one type of behavior that has been studied in detail in all three measurements. The behavior that is chosen is very relevant for the environment and has proven to be difficult to change because it appears to be quite strongly determined by habit (Verplanken et al., 1994). It is the choice of means of transportation for small distances, under 5 km. In general, consequences for the environment are far better when is decided not to take the automobile.

The analysis that will be presented here is based on Eagly and Chaiken's extended attitude-behavior framework (1993). In the model that is presented below (Figure 2) it is assumed that behavioral intentions and behavior are under the influence of five psychological factors:

- Habit, the degree to which behavior is performed automatically, without a conscious decision and with little cognitive effort (Triandis, 1980);
- Attitude towards the behavior. The attitude is determined by expectations of outcomes of behavior weighted by the evaluations of these outcomes. The attitude is usually determined by salient, direct individual benefits and losses (Fishbein and Ajzen, 1975; Manstead and Parker, 1995) and expresses the degree to which performing a behavior is experienced as pleasant or attractive;
- Perceived behavioral control, the degree to which performing behavior is expected to be under volitional control of the individual (Ajzen and Madden, 1985);
- Subjective norm, the degree to which the social environment supports or discourages the individual to perform the behavior (Fishbein and Ajzen, 1975);
- Personal norm, a concept that has been re-introduced recently in social psychology as part of attitude-behavior models and that expresses the degree to which a person feels that his conscience allows him to perform the behavior, as the behavior might have beneficial or harmful consequences for others (Parker, Manstead and Stradling, 1995; Gorsuch and Ortberg, 1983; Schwartz, 1977). This concept is recently being applied in the context of pro-environmental behavior (Vining and Ebreo, 1992; Hopper and Nielsen, 1991).



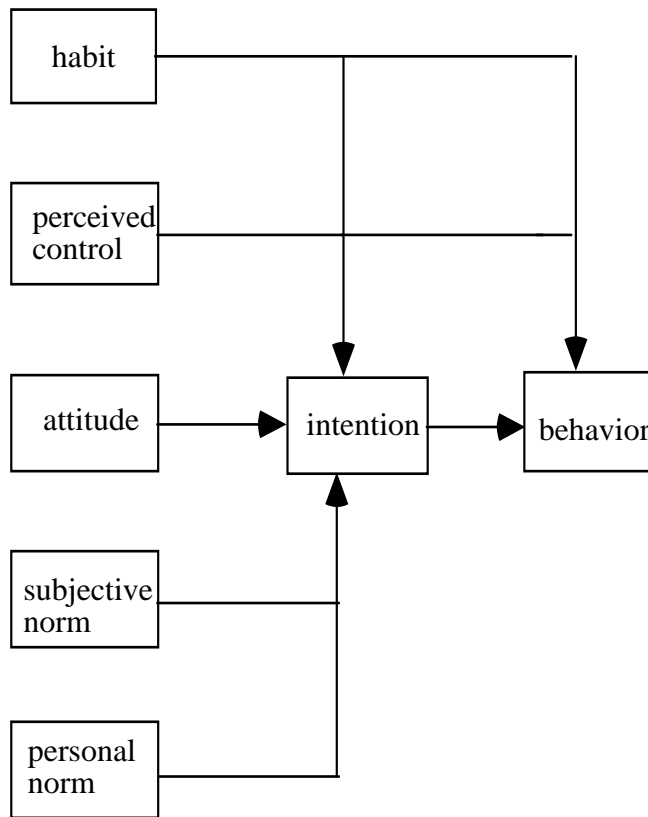


Figure 2. An extended attitude-behavior framework to explain and predict behavior (adapted from Eagly and Chaiken, 1993, p.209)

All 5 psychological factors described were been transformed into a series of questionnaire items measured at all three times (T0, T1, T2) of the study. All analyses presented below are based on data of car-possessing ETP-participants who have completed all three questionnaires (N=113).

### 5.1 Explanation of the analyses

The data collected allow three kinds of analyses. The first is the *explanation of behavior* based on the five psychological concepts. The second is the *explanation of the intention* also based on the five concepts, the third is the *prediction of future behavior* based on the intention, with habit and perceived control as additional predictors as they can be expected to influence behavior independent of intention. The explanation of behavior and intention could be performed at all three measurements, the prediction of future behavior is analyzed twice: behavior directly after the ETP (T1) can be predicted by scores of intention, habit and perceived control as experienced directly before the ETP (T0). Behavior six to nine months after participation (T3) can be predicted by scores of

intention and habit given directly after participation in the ETP (T2). Both times (T0->T1, T1->T2) predictions are made for behavior at least half a year later. The whole series of analyses is presented in table 8 to 15. Average scores and standard deviations of all concepts are given\* together with the simple Pearson correlations and beta weights (a beta weight is an estimation of the contribution of a specific variable with the influence of other variables corrected for) of each variable with the dependent variable. These data allow a comparison of average scores at T0, T1 and T2 and a comparison of the strength of predictor variables to explain intention and behavior. The scales of all variables run from 1 to 4 or from 1 to 7. In all scales '1' is the environmentally unfriendly score, '4' or '7' is the most environmentally friendly score.

## 5.2 Results

*Prior to the ETP* the choice of means of transportation is already mildly favorable. This is explained by two of the psychological concepts: a travelling habit that is reasonably favorable for the environment and a personal norm that is opposed to choosing the car for short distances (Table 8). Intentions for using means of transportation other than the car show that participants intend to abstain from car-use more than they are actually doing at that time. This intention is explained by their attitude towards use of other means of transportation, and the control they perceive over their choice (Table 9). After participation, the frequency of use of other means of transportation than the car has increased, which is caused by the favorable intention and supported by habit (Table 10).

*Directly after participation in the ETP* the habit of choosing other means of transportation has become more favorable and more influential (average score and beta weight of habit have both increased). While before participation the personal norm played a significant role, this seems to have been taken over by the role of habit (Table 11). When asked for intentions for the period to come, ex-participants' intentions have become more positive than they were before participation. These intentions are influenced by all four concepts\* : the attitude, on average even more favorable than before the ETP, habit, the personal norm (internal pressure), as well as the subjective norm ( social pressure) (Table 12).

*Six to nine months after participation in the ETP* the very favorable intentions and the solidly established habit at T1 appear to have caused the behavioral improvement at T1

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\* Changes in average scores will be mentioned only when statistically significant (p<.05, tested two-sided)

\* The concept of perceived control was not included in the questionnaire at T1, directly after participation.

to persist at T2. A durable behavior change after termination of the intervention is realized by the former participants. A further improvement in behavior, which might have been expected considering the intention at T1, has not taken place (Table 13). Behavior at T2 is mainly explained by habit, with some support of the subjective norm (Table 14). Intentions for future behavior are even more favorable than directly after participation. This is explained by the attitude towards other means of transportation, habit, personal norm and perceived control over circumstances that facilitate a choice for more environmentally friendly means of transportation.

Compared with the situation prior to the ETP, three of five predictors have become more beneficial for the environment: the attitude towards other means of transportation than the car, as well as habit and feelings of perceived control. This is obviously related to the improvements of behavior and behavioral intentions, as described in this paragraph. The pattern of results at T2 gives the impression that the improvement in the choice of means of transportation for distances under 5 kilometers, caused by the ETP and consolidated in the six to nine months after participation, will persist in the future.

Table 8: Explanation of choice of other means of transportation than the car at T0 (before participation) for distances under 5 km .

N = 113	Correlation with: Behavior T0	Beta	Means and standard deviations	
			M	std.
attitude (1-7)	.48***	.09ns	6.1	0.8
habit (1-7)	.75***	.51***	5.2	1.6
subjective norm (1-4)	.30**	.01ns	2.2	0.8
personal norm (1-4)	.64***	.25**	3.0	0.8
perceived control (1-7)	.58***	.07ns	5.3	1.5
BEHAVIOR T0 (1-7)	R <sup>2</sup> : 64%		4.6	1.4

(ns=not significant; \*=p<.05; \*\*=p<.01;\*\*\*=p<.001)

Table 9: Explanation of the intention at T0 to choose other means of transportation than the car for distances under 5 km.

N = 113	Correlation with: Intention T0	Beta	Means and standard deviations	
			M	std.
attitude (1-7)	.49***	.22*	6.1	0.8
habit (1-7)	.54***	.15ns	5.2	1.6
subjective norm (1-4)	.36***	.15ns	2.2	0.8
personal norm (1-4)	.49***	.09ns	3.0	0.8
perceived control (1-7)	.59***	.30**	5.3	1.5
INTENTION T0 (1-7)	R <sup>2</sup> : 46%		5.2	1.4

(ns=not significant; \*=p<.05; \*\*=p<.01;\*\*\*=p<.001)

Table 10: Prediction of choice of other means of transportation than the car at T1 by 3 psychological variables measured at T0

N = 108	Correlation with: Behavior T1	Beta	Means and standard deviations	
			M	std.
habit T0 (1-7)	.65***	.46***	5.2	1.6
intention T0 (1-7)	.63***	.39***	5.2	1.4
perceived control T0(1-7)	.48***	-.07ns	5.3	1.5
Behavior T1 (1-7)	R <sup>2</sup> : 51%		5.1	1.5

(ns=not significant; \*=p<.05; \*\*=p<.01; \*\*\*=p<.001)

Table 11: Explanation of choice of other means of transportation than the car at T1 for distances under 5 km.

N = 112	Correlation with: Behavior T1	Beta	Means and standard deviations	
			M	std.
attitude (1-7)	.53***	.00ns	6.4	0.7
habit (1-7)	.78***	.75***	5.5	1.5
subjective norm (1-4)	.16ns	-.02ns	2.3	1.0
personal norm (1-4)	.52***	.05ns	3.0	0.9
Behavior T1 (1-7)	R <sup>2</sup> : 61%		5.1	1.5

(ns=not significant; \*=p<.05; \*\*=p<.01; \*\*\*=p<.001)

Table 12: Explanation of the intention at T1 to choose for other means of transportation than the car for distances under 5 km

N = 114	Correlation with Intention T1	Beta	Means and standard deviations	
			M	std.
attitude (1-7)	.67***	.22**	6.4	0.7
habit (1-7)	.76***	.48***	5.5	1.5
subjective norm (1-4)	.33***	.13*	2.3	1.0
personal norm (1-4)	.63***	.18*	3.0	0.9
Intention T1 (1-7)	R <sup>2</sup> : 66%		5.6	1.4

(ns=not significant; \*=p<.05; \*\*=p<.01; \*\*\*=p<.001)

Table 13: Prediction of choice of other means of transportation than the car for distances under 5 km. at T2.

N = 113	Correlation with Behavior T2	Beta	Means and standard deviations	
			M	std.
habit T1 (1-7)	.66***	.33**	5.5	1.5
intention T1 (1-7)	.69***	.44***	5.6	1.4
Behavior T2 (1-7)	R <sup>2</sup> : 53%		5.1	1.5

(ns=not significant; \*=p<.05; \*\*=p<.01; \*\*\*=p<.001)

Table 14: Explanation of choice of other means of transportation than the car for distances under 5 km. at T2

N = 100	Correlation with Behavior T2	Beta	Means and standard deviations	
			M	std.
attitude (1-7)	.43***	-.07ns	6.3	0.8
habit (1-7)	.72***	.65***	5.5	1.5
subjective norm (1-4)	.41***	.21*	2.3	0.9
personal norm (1-4)	.50***	.02ns	2.9	0.9
perceived control (1-7)	.45***	.06ns	5.7	1.4
Behavior T2 (1-7)	R <sup>2</sup> : 56%		5.1	1.5

(ns=not significant; \*=p<.05; \*\*=p<.01; \*\*\*=p<.001)

Table 15: Explanation of the intention to choose other means of transportation than the car for distances under 5 km. at T2.

N = 100	Correlation with: Intention T2	Beta	Means and standard deviations	
			M	std.
attitude (1-7)	.63***	.23**	6.3	0.8
habit (1-7)	.75***	.34***	5.5	1.5
subjective norm (1-4)	.40***	-.02ns	2.3	0.9
personal norm (1-4)	.64***	.21*	2.9	0.9
perceived control (1-7)	.61***	.30***	5.7	1.4
Intention T2 (1-7)	R <sup>2</sup> : 71%		5.8	1.3

(ns=not significant; \*=p<.05; \*\*=p<.01; \*\*\*=p<.001)

## **CHAPTER 6: AFTER PARTICIPATION: FURTHER INVOLVEMENT WITH THE ETP AND BEHAVIORAL CHANGES OUTSIDE THE HOUSEHOLD**

What the ETP hopes to accomplish is that former participants will have changed their perspective on the environmental consequences of all their behavior. It is hoped that the learning process they have gone through will generalize to environmental relevant behavior in other domains and also that former participants are willing to share their experiences with others. In this chapter is described what generalization effects have occurred.

First will be described to what extent former participants have remained involved with the ETP, by discussing it with relatives and friends and by showing their willingness to remain active in the ETP. Next, effects in behavioral domains other than the household will be described. Data for this chapter was collected in the second post-ETP questionnaire which was completed by 165 respondents, six to nine months after participation.

### **6.1 Further involvement with the ETP**

An inventory was made to assess to what extent people had spread information about the ETP among relatives, friends and acquaintances and how this was received. The responses imply that more than half of the social environment had been informed while slightly less than half had received the advice to participate. Of those advised a large minority is planning to participate. The most frequently mentioned reasons that were given to recommend participation were: the environment, social support, financial savings and the pleasant group atmosphere. Important reasons not to recommend participation were that the former participant was not overly enthusiastic about his/her experiences, the expectation that others would react negatively or, just the opposite, that people were already very busy in performing pro-environmental activities. The reasons that were given by family, friends and acquaintances to consider participation fall into the same categories.

More formal involvement with the ETP afterwards can be expressed in several ways. Table 16 provides an overview of the various ways ex-participants remained involved.

Table 16. Involvement with the ETP after participation. Numbers and percentages are indicated. Each respondent could check more than one category.

	yes	intend to	N	
- I still attend meetings with my team	24 (17.6%)	14 (10.3%)	98 (72.1%)	136
- Active as a team coach	11 (8.15)	4 (2.9%)	121 (849%)	136
- Active as information officer for GAP	6 (4.6%)	-	124 (95.4%)	130
- Volunteer at a GAP EcoTeam centre	2 (1.6%)	3 (2.4%)	122 (96.1%)	127
- Approached the city council for ...	12 (10.3%)	3 (2.6%)	101 (87.1%)	116
- Otherwise	15 (16.3%)	1 (1.1%)	76 (82.6%)	92
<b>TOTAL</b>	<b>45 (33%)</b>	<b>18 (13%)</b>	<b>73 (52)</b>	<b>136</b>

Almost 20% still attends team meetings. A group of 8% has obliged themselves to the important task of coaching new teams. Others work as information officer or volunteer at one of the GAP report centres, have initiated activities with city councils or are active in some other way, mostly creating publicity for the ETP or attempting to solve environmental problems within the local community. A total of 33% remains involved with the ETP and functions as a second generation of 'intervention agents' (Geller, 1995) while an additional 13% is planning to do so.

## 6.2 Behavioral changes outside the household after participation

Four questions were asked, directly addressing behavioral changes that occurred since participation in domains other than the household. Of people with a job outside the home, 40% indicated they had changed their own behavior at work, while one third of the sample had contributed to improving general measures of good house keeping at work. These changes referred to saving energy and other resources, implementation of recycling facilities, providing environmental information at the workplace or other aspects of environmental policy of the organization. Since participation in the ETP 26% of the respondents had become active in the local community, mainly to create local facilities for better environmental behavior, while also 26% had changed their leisure behavior. Changes that were frequently mentioned were making more trips by bicycle and less trips by car or plane and travelling less far in general. 16% had become member of an environmental organization since. Responses are summarized in Table 17.

Table 17. Behavioral changes outside the household after participation (. Percentages in columns do not add to 100%, as respondents could give more than one answer. Each item contained the introduction 'after participation". These are not repeated in the table)

	yes	intend to	N	
- Has your environmental behavior at the work place changed ?	23 (40%)	2 (4%)	32 (56%)	57
- Have you contributed in improving measures of good house keeping in your workplace?	20 (34%)	2 (3%)	37 (63%)	59
- Have you participated in creating facilities for better environmental behavior in your community?	42 (26%)	7 (4%)	116 (70%)	165
- Has your leisure behavior changed in an environmental sense?	39 (26%)	6 (4%)	108 (71%)	153
- Did you become member of an environmental organisation?	25 (16%)	10 (6%)	125 (78%)	160
<b>TOTAL</b>	<b>87 (53%)</b>	<b>5 (3%)</b>	<b>73 (44%)</b>	<b>165</b>

Overall, 53% has become active in one or more ways outside the household.

*Conclusion:* this chapter has made clear that, for the majority of former participants, changes in pro-environmental behavior during and after participation were not confined to the household. A significant number had become active by supporting the ETP and by implementing pro-environmental changes at work, in the local community and in their leisure activities.



**CHAPTER 7: PARTICIPANTS' EVALUATION OF THE ECOTEAM PROGRAM**

In the first post-ETP questionnaire a series of questions asked participants' opinion about the main aspects of the ETP: the quality of the Workbook, the monthly registration of the weight of waste, use of gas, electricity and water, kilometers travelled by car and the way their Team had functioned. In addition, questions were asked on satisfaction about participating, compared to expectations that existed before, and a request was made for comments and suggestions. Responses were given by 205 former participants.

*The Workbook.* In general the Workbook was rated as rather informative and rather pleasant to read (Mean = 3.6 and 3.5 respectively, on 5-point scales ranging 'not' to 'very'). However, people who made suggestions for improvement of the ETP mentioned improvements for the Workbook in almost 50% of the cases\*

*The registration of waste, gas, electricity and water and kilometers travelled by car.* People considered registration useful and quite easy, with the exception of transportation which scored approximately neutral on both scales. For all themes registration was evaluated as approximately neutral, i.e., not boring and not pleasant.

*The Team.* The functioning of the Team was scored on a series of 8 dimensions. Average scores are given in Table 18.

Table 18. Evaluation of the Team (average scores and standard deviation, scales range from 1=not at all, to 5=to a very large extent, N=200)

	M	(Std.)
Did your team stimulate you to take action?	2.9	(0.8)
Did your team keep its appointments?	3.4	(0.8)
Was your team pleasant company?	3.5	(0.8)
Was there a strong feeling of connectedness within your Team?	2.9	(0.9)
Did you feel pressured by your Team to take action?	2.6	(1.0)
Was there an atmosphere of competition within your Team?	1.8	(0.9)
How did you experience this competitive mentality? (1=very unpleasant, 7=very pleasant)	5.1	(1.2)
Did you feel that your Team would provide practical support when asked	2.2	(1.0)

Table 18 shows that most team aspects are evaluated reasonably favorable with the exception of practical support that was expected of Team members. Noteworthy is the

\* A number of these suggestions has been used to publish a new, substantially changed, edition which is being used since medio 1995

virtual absence of competition, in the few cases that it was felt, it was experienced rather positively.

*Evaluation of the ETP.* The effort of participating was rated between small and neutral (Mean =2.6, 2=small, 3=not small/not large). Participants felt they had learned something about environmental problems and about the way they could make a contribution to improvement (Mean=5.0 and 5.2 respectively, on a scale ranging from 1=not at all to 7=very much) and considered their participation as reasonably pleasant (Mean=5.3 on a scale ranging from 1=very unpleasant to 7=very pleasant). Before participation they had expected slightly more than what they had experienced. Overall, their opinion about the ETP was moderately positive (Mean=5.4 on a scale ranging from 1= very negative to 7=very positive).

## CHAPTER 8: CONCLUSIONS AND FURTHER RESEARCH

### 8.1 Conclusions

How effective is the ETP? In the Introduction it was mentioned that effectiveness would be described on the five dimensions of reliability, speed, particularism, generality and durability.

The conclusions about the effectiveness of the ETP presented below will be structured by these dimensions. It must be noted that the five dimensions are not mutually exclusive. Nevertheless, the dimensions have important heuristic value to elucidate the main characteristics of the ETP. In describing the effectiveness of the ETP, some of the conclusions from three other studies we performed (Harland et al., 1993; Weenig et al., 1994; Staats and Herenius, 1995) have been incorporated as well.

*Reliability, the ability of the technique to change the behavior of those targeted.*

The present study has shown that for the group who participated in the ETP during 1994 a very large number of specific household behaviors had changed. A total of 46 of 93 behaviors changed significantly during the period of participation. Most changes occurred in behaviors that are performed regularly in the household while few changes occurred in behavior that is infrequently performed. Many of the latter refer to environmental alterations of the house for which investments may be necessary. This lagging behind of investments may however have been caused by the time it takes to prepare these changes which may exceed the period in which the study took place. We have seen, for example, that in the period after participation, some of this kind of changes have been realized. It is conceivable that especially the larger investments take even more time and fall outside the scope of the present study.

Overall however, the results can be considered a huge accomplishment of the ETP, which to our knowledge is unprecedented. From a narrow definition of reliability the ETP has been very successful. When the definition is broadened to include all people who are requested to participate, the picture changes. It appears that the decision to participate imposes a considerable barrier and selects a group that is already rather advanced in a pro-environmental sense. Although this is not contradictory to the objectives of Global Action Plan (cf. section 1.1) it impedes quick, large scale diffusion, even among pro-environmental individuals.

*Speed, the time it takes the technique to change behavior.*

The majority of changes took place in a period of approximately eight months with eight more changes observed six to nine months afterwards. The design of this study does not allow more specific estimations of speed. However, in our view, this pace is quite satisfactory, especially in combination with other characteristics mentioned below.

*Particularism, the degree to which the technique is universally applicable or has to be designed differently for subgroups or, at the extreme, for individuals.*

This criterion points out one of the unique features of the program. In general, the ETP can be considered rather particular. It is certainly more particular than a mass media information campaign, nevertheless its material elements, i.e., the Workbook and the Feedback, are standardized and do not require adaptations for subgroups or individuals. Communication with the Teams from the national or local EcoTeam centres and the support by a coach make it rather particular, however. In that respect we observe a demand for particularity that cannot be standardized and which makes running the ETP rather laborious. However, it is the Team aspect in the ETP formula that makes the ETP universal *and* very particular at the same time. The Team is a standard asset while *within* the Team interactions occur that can be very personal and specifically tailored to the needs and sensitivities of Team members. These aspects are taken care of by Team members themselves and therefore are not the concern of the organization, which means that this part of the technique can be universally applied and at the same time be highly particular because it is taken care of by the group that is subject of the intervention. In this respect the ETP responds to the admonition by de Young (1993, p.493) that people should be "afforded to conduct their own explorations, rather than being in the midst of someone else's large experiment". The ETP enables, even stimulates this approach, mainly by the Team aspect.

*Generality, the ability to change behavior that is not the direct target of the intervention but is conceptually related.*

In the previous chapters it has become clear that effects of the ETP generalize to a substantial degree to behavior at work, in the local community and to leisure activities. Moreover, a number of ex-participants has become involved with supporting and disseminating the ETP. These phenomena, in addition to the large number of changed household behaviors, clearly point to a large degree of generality. It constitutes a strong indication that participation in the ETP has been successful in having former participants consider the environmental consequences of their behavior in general.

*Durability, the persistence of changes when the intervention has stopped.*

It is especially on this dimension that the ETP has shown very good results. After having successfully changed 50% of the investigated behaviors during participation, it appears that six to nine months afterwards not only have these changes endured but a

respectable number of further improvements has occurred. As a result substantial and lasting savings of environmental resources have been accomplished. To our knowledge, the ETP is unsurpassed in this respect.

## **8.2 Further research**

This research has demonstrated the effectiveness of the ETP in changing environmental relevant behavior of its participants and has answered several important questions on how these effects might be explained. Nevertheless, several research questions remain, three of which will be sketched below.

The effects of participation appear to endure at least until six to nine months after participation. Research into the effectiveness of the ETP on even longer term, for instance one and a half year after the ETP has been completed, may further demonstrate the strength of the ETP. It should reveal whether or not effects as demonstrated in this research sustain after a very long period and whether larger investments (e.g. in less energy consuming appliances) in the households will be made in the long run.

Up till now only a limited number of people have participated in the ETP. To make use of the effectiveness of the ETP, effort should be made to obtain larger numbers of participants. One way to enhance participation, used at this moment, is by advising friends and relatives to participate in the ETP, thus using the social network of former participants. Other ways, also currently practised, is by organizing meetings to inform the public about the ETP and by being present at fairs and exhibitions. Research should be devoted to the question which strategy and which kind of activity renders the largest number of participants, e.g.: Which kind of network should be motivated, and which part of which canvassing activity is most successful?

Another way to reach a larger proportion of the general public, not used so far, is by means of mass-media instruments. Aspects that determine the intention to participate (Staats and Herenius, 1995, Weenig and Gijsman, in prep.) can be used to prepare a mass-media campaign that will be of help in raising participation to a larger proportion of the population.

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