

# The Influence of a Visit on Attitude and Behavior Towards Nature Conservation

Ruth Taylor  
Centre for Educational Studies  
King's College, London

## Introduction

Despite the long history of exhibitions being designed in an attempt to produce changes of behavior (Lowe, 1916), there is little evidence of their effectiveness. Many of the studies that exist use short term attitude change measures and assume that the appropriate behavior changes will follow. This is a dubious assumption (Ajzen & Fishbein, 1980). In this paper we look at long term measures of self reported behavior changes after a visit to a botanic garden.

There is little doubt that irreversible destruction of habitats in both the developed and developing areas of the world is taking place. On October 4, 1992, the London *Sunday Times* ran an article entitled "Rainforests will be gone in 50 years, warns U.N. report." The source for the headline was an unpublished United Nations study. According to this report the tropical rainforests are disappearing at the rate of more than 1 acre per second, an expanse of rainforest the size of England is being bulldozed or burnt per year. In 1987 Dr. Peter Raven (Director of the Missouri Botanical Garden) estimated that as many as 60,000 plant species, almost a quarter of the world's total (250,000), were at risk of extinction during our lives and those of our children (Raven, 1987).

However, in discussing this issue it is all too tempting to focus on areas of dramatic large scale destruction rather than focusing on one's own back-yard, and the impact the actions of an individual can make in their own local environment. The maxim, "Think globally act locally," is an important one.

Many writers have suggested that the solution to the environmental problem is to make people change the way they behave, either voluntarily or by coercive means. Maloney and Ward (1973) describe the ecological crisis not as a technological problem but as a crisis of maladaptive behavior. *Caring for the Earth. A Strategy for Sustainable Living* (IUCN/UNEP/WWF, 1991) suggests that, "To adopt the ethic for living sustainably, people must re-examine their values and alter their behavior." Newhouse (1990) states that technology alone can not solve environmental problems.

“Ultimately, human action will be the basis for the success or failure of sustained diversity of life.” To produce a change in behavior, people need to be aware of the actions they can take.

Botanic gardens, among other organizations, have a role to play in environmental conservation both in the conservation of plants and in the education of the public. There are about 1,500 botanic gardens in the world, growing up to 80,000 plant species between them. With these large and diverse collections of plants botanic gardens can serve to educate people using their collections as a living museum.

In 1989 the Botanic Gardens Conservation Secretariat produced the *Botanic Gardens Conservation Strategy* (IUCN, 1989). One of the strategy’s aims was to “focus public attention on the issues of conservation through appropriate educational displays and programmes.”

One way of focussing attention on conservation issues is to set up an exhibition or display. Exhibits have often been designed to provide an informal learning experience for visitors. This can include affective learning, such as the formation or alteration of attitudes toward some aspect of the content of the exhibition. They can also attempt to influence behavior through changing beliefs.

### **The Exhibit on *Endangered Island Plants***

An exhibit at Chelsea Physic Garden entitled *Endangered Island Plants* provides the setting for this study which examines the success of the exhibition in altering the belief and behavior of visitors towards plant conservation, specifically their own “gardening behavior”.

Chelsea Physic Garden is the second oldest botanic garden in England, set up by the Society of Apothecaries in 1673 to grow plants for study and to be used in medicines. It is now thriving as a small botanic garden set up as a charitable trust managed by a board of trustees. It is open to the public on Wednesday and Sunday afternoons between March and October. The Garden’s size, (3.5 acres), and with only one entrance and one exit used by the public, means that it is ideally suited to studies of this type.

The exhibit was based in a small conservatory, off the lower lecture room used to serve tea on open days, with additional information boards in the room itself. Visitors could walk either way through the exhibit. (One problem of placing an exhibit in this location was the strong exit effect of people being able to see the exit as soon as they entered, and also being more interested in buying a cup of tea than looking at the display!)

The exhibit consisted of endangered plants from islands such as the Canary Islands, Madiera and Madagascar. Each plant was labelled with its name, the location it came from, the reason for it being endangered, and the level of threat (using the categories outlined in the *IUCN Plant Red Data Book* [Lucas & Syngé, 1978]).

In the lecture room a series of display boards showed photographs of endangered plants and threats to their survival. Living plants were used in the exhibit so that visitors could identify closely with the effect of habitat destruction on particular species of plants.

The exhibit made the following points:

- 1) An outline of the specific conservation risks affecting endemic plants on islands,
- 2) the reason plants need to be conserved,
- 3) what you can do about plant conservation,
- 4) the importance of private gardens in plant conservation,
- 5) what you can do in your garden—ideas for how to be a conservation-minded gardener,
- 6) the link between this behavior and a positive outcome—if we all carried out some of these activities we are more likely to be giving future generations an environment fit to live in.

Copies of the U.K. Government, Department of the Environment booklet, *Wake Up to What You Can Do for the Environment*, were placed in the exhibit for people to take away. This had a similar message, showing what actions people could take individually and how these would help the environment.

### The Research Model

Of the many researchers who have studied influences on attitude and behavior, Ajzen and Fishbein (1980) provide a useful model in their Theory of Reasoned Action.

According to this theory, a person's behavior may be explained in terms of a limited number of concepts (see Figure 1):

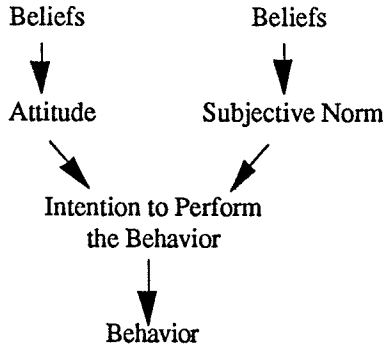
- a) the person's *intention* to perform that behavior;
- b) the person's *attitude* toward that behavior;
- c) the *subjective norm* (i.e. the person's perception of the pressures put on him to perform or not to perform the behavior in question);
- d) the *beliefs* underlying the attitude (i.e. that the behavior leads to certain outcomes and the person's evaluations of these outcomes), and the *beliefs* underlying the subjective norm.

According to Ajzen and Fishbein (1980), beliefs underly a person's attitudes and subjective norms and ultimately determine intentions and behaviors. Behavioral change is ultimately the result of changes in beliefs. In order to influence behavior people have to be exposed to information which will produce changes in their beliefs.

An example of such a belief might be the belief that not buying wild collected plant bulbs would help conserve the numbers growing in the wild. In order to influence the behavior of buying bulbs people need to know that

Figure 1

Ajzen and Fishbein's Theory of Reasoned Action



not all bulbs are propagated in nurseries, some are dug up from the wild and sold. People also need to know that removing bulbs from the wild will severely reduce the wild populations of bulbs. (Other useful information would be a method of distinguishing between nursery grown and wild bulbs; in Britain a labelling system is being introduced.) The attitude toward the behavior could be discovered by asking the respondent to rate their answer to the question, "my not buying wild collected bulbs is..." on an evaluative scale, as follows:

good \_\_\_\_\_: \_\_\_\_\_: \_\_\_\_\_: \_\_\_\_\_: \_\_\_\_\_: \_\_\_\_\_: \_\_\_\_\_: bad  
 extremely quite slightly neither slightly quite extremely

There are two strategies which can be adopted in influencing beliefs: "we can try to influence some of the beliefs that are salient in the subject population or we can try to introduce novel, previously non-salient, beliefs" (Ajzen & Fishbein, 1980, p.224). In this study salient beliefs were influenced by a persuasive communication, i.e. an exhibit with a message to persuade people of the importance of their actions. "To be effective a persuasive communication should contain information linking the behavior to various positive or negative outcomes." "When the aim of the message is to change behavior, the message will often also include one or more recommended actions," (p. 225).

The purpose of the exhibit was to encourage people to change the way in which they behaved in their own garden. They were encouraged, for

example, to increase their use of compost and organic gardening methods, to avoid pesticide use, and to buy bulbs raised commercially rather than those collected from the wild. By introducing the belief that our gardens are important wildlife habitats and a place where plants can be conserved, the attitude toward the behavior of gardening in an "environmentally friendly" way will be enhanced. This will in turn lead to an intention to perform the behavior, and then, the behavior being performed.

## Results

To assess the effectiveness of the exhibit in changing awareness, beliefs and behavior towards plant conservation, visitors were asked to complete questionnaires. Two groups of questionnaires were used in this analysis. Those from 1) Visitors who had just entered the garden (69 respondents), and 2) Visitors who had been through the exhibit (50 respondents). As a follow up one to six months after their visit a further questionnaire was used with visitors taken from the groups already interviewed. These questionnaires assessed the long term effects of their visit including any reported changes in behavior (66 respondents).

### Awareness

To assess awareness of plant conservation, respondents were asked in the first questionnaire (during their visit): "What are the reasons which might be given for conserving plant species?," and "Can you name any particular plant species needing protecting or conserving?" The reasons the respondents gave for conserving plant species were grouped under broad descriptive headings (see Table 1). These varied significantly between the pre and post groups, with more functional and ethical comments from the group who had seen the exhibit. Functional responses included, "the importance of plants in providing food and medicines," and ethical comments included, "the rights of plants to be on the earth," and, "not killing things we cannot replace." Other response categories among which pre and post differences were found included less potential future use, intellectual use, and preservation comments ( $\chi^2=11.7$  with 5 df,  $p<.05$ ).

Despite the fact that visitors to the exhibit could draw on information in the display, nearly 60% of visitors questioned were not able to name a plant needing protecting or conserving either before seeing the exhibit or after.

### Beliefs

To assess the beliefs of visitors towards conservation of plants, they were asked, "what might you be able to do to help conserve plants and the environment?" Responses were categorized according to whether the actions were effective in conservation such as "giving cuttings away" and "encouraging butterflies;" and those actions which would be ineffective in themselves such as "pulling up all the weeds" and "growing nice plants."

Table 1

Categories of Response to the Question,  
 "What are the reasons which might be given  
 for conserving plant species?"\*

	Pre (n=69)		Post (n=50)	
Functional comments	37	54%	30	60%
Ethical comments	5	7%	14	28%
Potential future use	22	32%	13	26%
Intellectual	7	10%	4	8%
Preservation	19	27%	6	12%
Other	9	13%	7	14%

\*Multiple responses were possible.

It is clear from looking at the numbers in the table that the category of effective general environmental action shows an increase in the number of responses from the group who had seen the exhibit, and the category of effective action donating money shows a decrease in the number of responses from the group who had seen the exhibit. A comparison of each of these categories in turn in a two by two contingency table, comparing pre and post responses against "effective or ineffective and lack of response," gives a significant difference for general environmental action ( $\chi^2=5.8$  with 1 d.f.,  $p<0.02$ ), but a non-significant response for donating money. The display has had the effect of focusing the beliefs of visitors towards *direct* environmental action—i.e action which has a direct effect on the conservation of plants, including the way they behave in their own gardens—and away from indirect action such as educating people and donating money, which were not mentioned in the text of the display.

### Attitudes

As might be expected from visitors to botanic gardens, the visitors to Chelsea Physic Garden already had positive environmental attitudes which did not vary significantly between the visitors questioned before or after visiting the display.

On a series of questions relating their attitude toward "environmentally friendly" behavior, respondents indicated on a five point scale whether they agreed or disagreed with a series of statements.

Table 2

Categories of Response to the Question,  
 "What might you be able to do to help conserve plants and  
 the environment?"\*

	Pre (n=69)		Post (n=49)	
Gardening				
-Effective	26	38%	19	39%
-Ineffective	9	13%	4	8%
Campaigning				
-Effective	3	4%	3	6%
Educating				
-Effective	12	17%	7	14%
-Ineffective	2	2%	1	2%
Donating money				
-Effective	23	33%	12	24%
-Ineffective	1	1%	0	0%
General environmental action				
-Effective	14	20%	20	41%
-Ineffective	9	13%	6	12%

\*Multiple responses were possible.

87% of visitors questioned before seeing the exhibit and 90% of visitors after agreed with the statement: "I should use natural products as pesticides in my garden."

85% of visitors before seeing the exhibit and 84% of visitors after disagreed with the statement "I should buy furniture made from tropical hardwood."

Other data, not reported here, showed similarly high levels of positive attitudes. This generally high positive attitude gave little room for change to be detected from a brief visit to a display of this nature.

### Behavior

The behavior of visitors was investigated by asking questions about their behavior in their own gardens.

Of the total number of visitors questioned, 78% of visitors reported having a garden, 71% of all visitors reported growing native plants, 64% reported making compost from plant waste, and 48% reported maintaining part of their garden for wildlife. These figures are almost certainly higher

than would be found in the population as a whole. For example in *Wake Up To What You Can Do For The Environment* (1990), the figure given for people in Britain recycling household waste as compost is 25%.

### Follow-up to assess long term changes

After completion of the questionnaires visitors were asked if they would complete a follow-up questionnaire some time in the future. One hundred-nineteen visitors were sent questionnaires between 1 and 6 months after the original visit; of these 66 returned the follow-up. Of the 66, 46 had seen the exhibit, (15 of these were originally included in the pre groups and had visited the exhibit after being questioned). The analysis below is based on the 46 follow-up who had seen the exhibit.

Visitors were asked to think back to their visit and record what two things they remembered best about the Garden. They were also asked what they remembered about the layout of the Garden, the information given in the Garden and any horticultural advice given. Seventeen percent mentioned the exhibit as one of the things they remembered about the Garden. When asked specifically about the exhibit and what they could recall from it, 78% recalled information from the display. The relative lack of memorability of the exhibit when recalling the Garden may be due to the the nature of episodic memory where critical incidents are recalled in favour of generalized knowledge, which needs repeat visits to build up.

Of those who visited the exhibit, 24% reported that they had made changes in the way they gardened as a result of seeing the exhibit, and 72% reported to have been influenced by other sources in the way they behaved towards wildlife and the environment in their home and garden. Given that the visitors to the Garden who were questioned showed a strong positive attitude towards the environment, this figure (24%) shows that the exhibit had an important impact. The exhibit was only one part of an overall influence on visitors beliefs and attitudes towards their behavior in their own gardens. When asked about other sources of influence, respondents often spoke or wrote about books, television, radio, and magazines. Also, many of the visitors would already be aware of the importance of their gardens for conservation from other sources and would not be in a position to change an already positive behavior.

## Conclusions

By planning the exhibit within the context of the Theory of Reasoned Action we have been able to influence visitors' behavior by influencing beliefs and attitudes. Of visitors to the exhibit who were questioned, 24% said that they were influenced to positive behavior after visiting the exhibit. It is quite likely that the other 76% were already behaving positively towards conservation in their gardens and had little potential for change.



The results also show the important influence of other sources of information.

Of the visitors to Chelsea Physic Garden who were questioned, the majority showed positive general environmental attitudes and reported some positive environmental behavior. The problem in influencing these people was not one of altering attitudes and behavior but focusing it to be effective. Botanic gardens would find it useful to note that: (1) an exhibit can influence the beliefs of a visitor as a precursor to a change in behavior; (2) general environmental attitudes of visitors may already be positive but an exhibit is able to focus their actions to be more effective.

### References

- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Great Britain, Department of the Environment. (1990). *Wake up to what you can do for the environment*. London: Department of the Environment.
- IUCN/UNEP/WWF. (1991). *Caring for the earth. A strategy for sustainable living*. Gland, Switzerland.
- Lowe, E.E. (1916). Infant welfare in the Leicester Museum. *Museums Journal*, 15: 254-264.
- Lucas, G., & Syngé, H. (1978). *The IUCN plant red data book*. IUCN, Morges, Switzerland.
- Maloney, M. & Ward, M. (1973). Ecology: Let's hear from the people. *American Psychologist*, 28, 583-586.
- Newhouse, N. (1990). Implications of attitude and behaviour research for environmental conservation. *Journal of Environmental Education*, 22, 26-32.
- Raven, P. (1987). The scope of the plant conservation problem world-wide. In D. Bramwell, O. Hamann, V. Heywood, & H. Syngé (Eds.) *Botanic Gardens and the World Conservation Strategy*. London: Academic Press, pp. 19-29.
- WWF, IUCN-BGCS. (1989). *The botanic gardens conservation strategy*. Gland, Switzerland.

### Acknowledgements

I am most grateful for the guidance and encouragement of Professor Arthur Lucas and John Barker during the research and writing of this paper. Without the help of Sue Minter (Curator) and the visitors who answered questionnaires at the Chelsea Physic Garden this work would not have been possible. I would also like to thank Dr. Roger Miles for helpful comments on drafts of the paper, and the Natural History Museum for support of the research from 1992-1993.