

## **PREDICTING PRO-ENVIRONMENTAL ATTITUDES AND BEHAVIORS: A MODEL AND A TEST**

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### **ABSTRACT**

The level of public commitment to environmental sustainability is unclear; most people appear inactive in terms of effective pro-environmental behavior despite optimistic reports from public opinion polls. Mounting degradation is evidence that pro-environmental behavior has declined or at least has grown insufficiently to make a difference to environmental degradation rates. There has been a call for a fresh approach to resolve accelerating degradation. We take up this challenge and suggest that most people live in urban environments low in functional natural values. Consequently they do not understand that their continued existence depends on naturally functioning ecosystems. We investigate the effect of direct experience of a naturally functioning ecosystem (versus a constructed environment) on conservation attitudes and rates of pro-environmental behavior. Results suggest that frequent experience of a naturally functioning ecosystem was more strongly linked to conservation attitudes and pro-environmental behavior than frequent experience of a constructed environment (such as a zoo).

### **INTRODUCTION**

The responsibility for maintaining and improving environmental quality is accepted by most nations [1]. Public opinion has led to legislation to promote recycling of solid waste in the United States [2] and to ambitious goals for active waste minimization programs in Europe and North America [3]. However, many

people simply do not participate and few countries are achieving their goals [3]. Waste in the United States is at its highest level ever and only one third of it is recycled [4].

Despite optimism about levels of pro-environmental behavior and concern for the environment [5-14], there is serious doubt that actual behavior has changed dramatically. There is a growing feeling that most people are still inactive with respect to effective pro-environmental behaviors [15-18]. An alarming suggestion is that environmental concern has cooled down through the nineties [19].

While the debate continues over levels of environmental concern and causes of pro-environmental behavior, waste increases [20], biodiversity decreases [21, 22], water and air quality diminish [23], and worldwide consumption rates soar ever higher [24]. The recycling industry's ability to recover packaging materials and discarded goods is dwarfed by purchasing activity, recently extended through television buying networks and the internet [20]. Even transnational agreements aimed at changing individual behavior and consumption patterns in recognition of the immediacy and scope of environmental threats, have not stemmed protracted environmental degradation [25]. This evidence argues that environmental concern and pro-environmental behavior has declined or at least has grown insufficiently to make a difference to rates of environmental degradation.

Despite 30 years of marketing research into environmental issues [26, 27], the level of public commitment to environmental sustainability is unclear, and it appears that the growth of individualistic pursuits [will] imperil not only our common base, but also our very existence [28]. Several authors have suggested resolution to the accelerating degradation of our common natural resources lies in a fresh approach [20-31].

## RESEARCH PURPOSE

This article takes up this challenge and applies fresh thinking to the persistent issue of non-participation in pro-environmental behaviors. Our tenet is that many people live in ecologically impoverished urban or constructed environments (i.e., agricultural areas). Eighty percent of people in OECD countries live in urban environments low in functional natural values [22] where their daily lives are disconnected from nature, yet their existence depends on naturally functioning ecosystems that provide the basics of food, air, clean water, etc. [23, 32]. Many seem unaware that these basics are at risk from major environmental problems despite it being widely articulated in the scientific and popular press.

This apparent indifference to the environment is perhaps fueled by the Western anthropocentric tradition, wherein humans historically view themselves as separate from nature and immune from ecological constraints and consequences [33, 34]. Many citizen consumers also adhere to the "Dominant Social Paradigm"

[35, 36] which contends that resources are limitless and growth is a necessity, that environmental problems will be solved by science and technology and which maintains a commitment to laissez-faire economic principles, and the sanctity of self-interest private property rights [33].

Our research investigates the effect of direct experience of the natural environment on pro-environmental behavior and attitudes toward the environment. We suggest that linking people's lives to the naturally functioning (i.e., unconstructed) environment through direct experience of natural ecosystems affects rates of pro-environmental behavior and improves understanding and attitudes toward natural environments. This approach is related to recent findings that participation in appreciative outdoor recreation (day-hiking, backpacking, and nature viewing) rather than consumptive outdoor recreation, had a mediating effect on the attitude-behavior relationship and improved prediction of pro-environmental behavior [37]. Tarrant and Green [37] felt that direct experience and direct involvement of the natural environment was more likely to influence behavior than more passive, nonpersonal experiences because attitudes are more accessible. Direct experience should improve knowledge (although this is not tested) and environmental knowledge has been shown to predict pro-environmental behavior [38, 39], however, it is suggested that many consumers may not have the requisite knowledge to make such ecological decisions [39]. Further, consumers who feel that humans must live in balance with nature, in general attempt to make ecologically correct decisions about the products they choose to buy [10].

### **WHY DO CITIZEN-CONSUMERS APPEAR WEAKLY COMMITTED TO THE ENVIRONMENT DESPITE STRONG ENVIRONMENTAL ATTITUDES?**

A number of studies have demonstrated links between values and attitudes and attitudes and behavior [40, 41] to the extent that researchers believe that behavior can be predicted by examining values and/or attitudes [41, 42]. If an attitude is "an enduring set of beliefs about an object that predispose people to behave in particular ways toward the object" [43, p. 257], then people who possess strong pro-environmental attitudes should behave in ways consistent with those attitudes (e.g., recycle, compost or buy biodegradable products).

Some studies [44-46] report a positive relationship between attitudes toward the environment and ecologically responsible behavior, others find no relationship [e.g., 47-49], or only a weak one [50]. Several explanations have been offered to explain these inconsistent results. The following factors are significant to this study: 1) attitude was associated with behavior more predictably and consistently when the attitude was formed through direct experience; 2) environmental behaviors are often not highly correlated among themselves and may not be part of a single construct; 3) studies have used different levels of specificity in measures of attitude and behavior, and 4) there may be little effect with respect to low

involvement purchases. A further reason why there may be little linkage between attitudes and behavior may relate to 5) seemingly imperceptible consequences of personal behavior on environmental degradation.

### **(a) Influence of Direct Experience on Pro-Environmental Behavior**

A consistent finding is that attitudes formed on the basis of direct experience are highly predictive of subsequent behaviors [51-56]. These studies indicate that people who experience an event (e.g., hiking in the wilderness) are more likely to form attitudes that are subsequently acted on.

Often attempts to increase pro-environmental behavior are based on more indirect methods such as incentives, advertising campaigns, education or brochures, which have been found to have an inconclusive effect on long-term behavior. A number of studies report that the use of monetary incentives (i.e., cash for recyclables, prizes) increases recycling behavior [57- 60]. However the removal of incentives resulted in a return to the base-line behavior [61- 63]. This is not surprising, since behavioral theory predicts that the removal of antecedent conditions leads to the extinction of the reinforced behavior [64].

Effectiveness of indirect methods has been questioned because they have not lead to an enhanced level of environmental knowledge for many people [64-67]. Others believe that indirect methods have been effective in creating more environmental awareness but this awareness has not translated into behavior [68]. This latter view is supported by Seligman [69]. He reported that even when consumers were well informed, they often failed to act on their knowledge. On the other hand, a number of researchers [44, 48, 70, 71] *have* demonstrated that knowledge about environmental issues in general, or knowledge about specific aspects such as recycling, are significant predictors of recycling behavior.

While the question remains over the effectiveness of indirect methods to influence behavior, results from direct experience are more compelling. Smith and Swinyard [56] found that attitudes were changed more by trial than advertising and subsequent behavior was better predicted by attitudes derived from direct experience (of the product). Fazio and Zanna [54] found that attitude was associated with action more predictably and consistently when the attitude was formed through direct experience. Attitudes can also be strengthened through repetition; when this is done behavior is more consistently related to attitude [72]. Most recently, forest recreation activity was found to have a positive influence on pro-environmental behavior [73] and Metzger and McEwen [74] found that environmental sensitivity increased as a result of direct sensory experience in the natural environment. This emphasizes the belief that merely teaching awareness of environmental problems is not sufficient [75].

Holbrook [76] maintains that without direct experience of an object like a natural habitat the development of a concept of value is difficult, since valuing something depends on being able to interact with it. He believes that attributing value to an object (such as a natural habitat like a conservation national park) must stem from the capacity of that object to contribute to an experience. Other authors such as Bond [77] and Levitt [78] support this view. Holbrook's definition indicates that value comes from consumption of the service (usage or appreciation) not from the object itself. In other words, the value of a national park stems from people's experience of it. People who do experience it fail to develop a sense of value toward the natural habitat of the conservation national park. This line of logic leads one to assume that if people do not experience the natural (unconstructed) environment they are less likely to act in an environmentally responsible manner.

The evidence regarding direct experience implies that people having environmentally relevant experiences are more likely to translate their environmental attitudes into behavioral decisions, including perhaps, consumption decisions [51]. Further, repeated experience of the natural environment might be expected to strengthen attitudes and produce more consistently environmentally responsible behavior because it improves general environmental knowledge. Therefore, Berger and Kanetkar [51] stress the importance for decision-makers of studying the effects of environmental experiences on pro-environmental behavior. This may be an especially useful approach since direct experience of the natural environment or environmental issues may be more effective than indirect methods, such as promotional campaigns, in creating positive attitudes and promoting more environmentally responsible behavior.

### **(b) Environmental Behaviors May Not be Part of a Single Construct**

It is often assumed that people who engage in one pro-environmental behavior will engage in others because of their concern for the environment. Tracy and Oskamp [79] found that pro-environmental behaviors are not highly correlated among themselves and may be influenced by different factors. Stern and Oskamp [80] suggest that the reason is that general pro-ecology attitudes reflect a number of different environmental issues (e.g., energy conservation, air pollution, biodiversity conservation, acid rain); and in this work they conclude that a relationship between general environmental concern and specific behaviors is unlikely.

However, Kaiser [81] argues for a single construct in which environmentally responsible behaviors are influenced by general environmental concern. We contend that it is critical for sustainability that people understand that although pro-environmental behaviors may relate to different activities, the outcomes of these behaviors are related ecologically.

**(c) Different Levels of Specificity in Measures of Attitude and Behavior**

The theory of reasoned action [82] is one of the most influential theories describing the attitude-behavior relationship. It has been employed to understand ecological behaviors such as recycling [83-85], water conservation [86], and energy conservation [87].

According to the theory of reasoned action, behavioral intentions are determined by a person's attitudes (i.e., subjective positive or negative evaluations of performing the behavior) and by a person's perceptions of social pressure to perform the behavior (i.e., subjective norm). Ajzen and Fishbein [88] warn that behaviors are less likely to be correlated with general attitudes, and advise that attitude measures are expected to predict only behaviors closely related to the specific action under consideration. This advice, together with the apparent lack of relationship between general environmental concern and behavior has led some authors to focus on more specific attitudes as they relate to specific behaviors [50, 89, 90].

Rather than ignore the critical question of whether general environmental concern was related to behavior and concentrate on more specific attitudes, Schultz and Oskamp [91] continued to investigate the link between general attitudes and pro-environmental behavior. They conclude that there is a link between general attitude to the environment and pro-environmental behavior and find the problem lies in the application of the theory of reasoned action, which is simply inadequate to describe the relationship between environmental attitudes and pro-environmental behaviors.

Consumers may perform inconsistently in terms of their attitudes because of factors such as financial resources, time and energy, or the needs and wishes of others. McCarty and Shrum [41] showed that regardless of how important individuals believed recycling to be, convenience exerted a more powerful influence on their behavior. The attitude environmental behavior relationship is also modified by income, education, and political persuasion [92, 93], and effort in relation to recycling [91]. Taylor and Todd [94] also find there are other factors apart from attitude and subjective norm which influence environmental behaviors, such as people's ability to compost, the availability of resources, and the degree to which they feel they have control over their decision to act. They cite the Goldenhar and Connell case [85] where the theory of reasoned action accounted for only 6 percent of the variance in recycling behavior intentions [94].

Similarly, Schultz and Oskamp [91] found environmental concern predicted recycling when the amount of effort required was relatively high, but not when the amount of effort was lower or when incentives were added. This result is consistent with the theory of planned behavior, which maintains that the perceived ease or difficulty of performing an activity will affect both intentions to act and actual behavior [95].

**(d) Low Involvement Purchases**

Another factor that may affect the translation of attitudes into behavior is the type of purchase. Most shopping products such as soap powder or wrapping paper are classed as low involvement purchases. Consumers who are not involved are considered passive consumers who may not be aware of the issues, possess little information regarding these issues, and have little or no consideration of alternative solutions [95, p. 171].

However, the concept of involvement is consumer related not product related [96]. It is defined in terms of a consumer's evaluation of the importance of and identity with the product. Therefore, one might expect that purchasers who are aware of environmental issues may be more involved purchasers of these basic commodities than those consumers who do not understand the relationship between their behavior and deleterious effects on the natural environment.

**(e) Imperceptible Ecological Consequences of Personal Behavior**

The theory of rational intentional behavior is based on perceived consequences and the strength of belief in these consequences [97]. Many personal consequences of behavioral choices can be seen directly, while most ecological consequences of individual's behavior are either imperceptible or perceived only indirectly, because humans perceive only processes that occur on a human scale (i.e., limited in time span, size, and location) [Gibson cited in 98]. However, ecological processes (including the effects of our behavior on environmental degradation) occur on such a scale that they are humanly imperceptible [97]. It seems that significant results in terms of reduction of waste or global warming can only result from the collective action of entire communities and so the consequences of our personal behavior appear inconsequential.

So it seems that according to the rational intentional behavior model [96] an individual's behavior will tend to be influenced more by the personal consequences of the behavior than the ecological consequences. It is suggested that this is because the rational decision maker has to pit known short-term personal outcomes against possible long-term societal outcomes [98].

**PROPOSED MODEL**

Biodiversity loss, pollution, land degradation and other environmental problems are all the result of human behavior, yet solutions are often provided in isolation. Indeed much of the theory summarized above treats one aspect of behavior in isolation of others. Integration may increase insight and hence we propose and test the following model (Figure 1) to describe the influence of direct experience (rather than indirect experience like information) on attitudes to conservation of the natural (or unconstructed) environment and pro-environmental

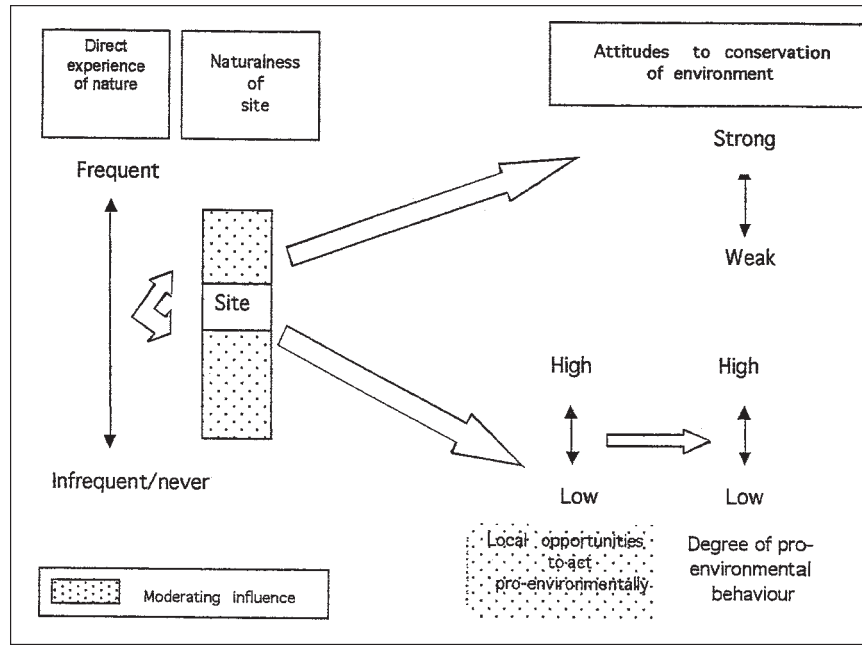


Figure 1. Model of relationship between experience of the environment and conservation attitudes and pro-environmental behaviors.

behaviors. Since we are exploring whether links exist between experience of the natural environment and attitudes, and between experience of the environment and environmentally responsible behavior we do not assume or test possible links between attitudes toward conservation of the environment and pro-environmental behaviors. It is also important to point out that we distinguish a natural environment from a constructed environment. The latter includes both urban and agricultural/horticultural areas where nature is rarely represented by functioning native ecosystems.

The model proposes that frequent direct experience of the natural (unconstructed) environment is linked to stronger attitudes to conservation whereas infrequent or lack of use of the environment yields weaker conservation attitudes. We expect that frequent or experienced visitors to the natural environment gain knowledge and understanding which affects their attitudes and behavior toward its protection including recycling and purchasing environmentally responsible goods. We propose also that this relationship may be moderated by the type of experience people normally choose. Thus, frequent experience of more natural sites strengthens the relationship whereas frequent experience of artificial or constructed sites weakens the relationship. If the system they experience is more



artificial and does not reflect typical environmental processes, then we are interested in whether this affects their attitudes or pro-environmental behavior.

In terms of pro-environmental behavior, our model proposes that frequent direct experience of the natural environment is related to more pro-environmental behavior. We also suggest that this relationship is moderated by variables such as: (a) the degree of naturalness of the preferred type of experience, and (b) the opportunity to perform pro-environmental behaviors. Thus, the more natural the experience normally engaged in the more we might expect their behavior to be environmentally responsible. However, the behavior may not be expressed since there may be no local opportunities to recycle or purchase recycled goods for example. This is in accord with Fishbein and Ajzen's theory [97] that social and physical environmental factors may constrain the expression of behavior despite strong intentions.

The following propositions reflect this reasoning and are the aims of the study.

- a. Do frequent or experienced visitors of the natural environment exhibit more positive attitudes to the environment and its conservation than novice visitors?
- b. Do frequent or experienced visitors of more natural environments exhibit more positive attitudes to the environment and its conservation than frequent or experienced visitors of less natural or constructed sites?
- c. Do frequent or experienced visitors of the natural environment display more pro-environmental behavior than novice visitors?
- d. Do frequent or experienced visitors of more natural environments exhibit more pro-environmental behavior than frequent or experienced visitors of less natural or constructed sites?

## METHODS

### Sample

The data were collected from visitors at two New Zealand "nature-tourism" destinations using a written questionnaire. The sample selected for this study consists of 615 New Zealand urban dwelling residents who face similar opportunities for recycling and waste disposal and similar product choices with the same national labeling standards. In this way we controlled for external factors that might affect overt behavior such as not having a glass recycling scheme available.

Stratified random sampling was employed on random days over several months from March-June 1999. Visitors were approached at the end of the visit and asked to fill in the survey. Two destinations were chosen to represent distinctly different nature tourism experiences and degrees of naturalness. At the less natural end of the spectrum, the Auckland Zoological Park provides opportunities to view endemic and exotic animals in enclosures and park-like surroundings within an

urban setting. We term this the constructed site. At the natural end of the spectrum Tiritiri Matangi Island is a recently revegetated island where native flora and fauna are easily seen and experienced in a wilderness setting. Visitors frequently revisit both sites.

### **Measurement of Experience**

Visitor experience of the natural environment was measured as the frequency of use. Such experience-based knowledge measures are criticized by Alba and Hutchinson [99]. They feel that product familiarity defined as the number of product-related experiences (e.g., the number of times a tourist experiences a destination or type of destination) do not capture the complexity or all of the dimensions of consumer knowledge. However, the number of experiences of the natural environment may be a useful indicator of general environmental knowledge as other studies have demonstrated that knowledge about environmental issues, in general, is a significant predictor of environmentally sensitive behavior [44, 70]. Furthermore, Nord et al. [73] report that frequency of visits to forest areas and the use of forest recreation activities are moderately associated with pro-environmental behavior.

Respondents at each site were asked to indicate the frequency they visited the particular site (e.g., the Zoo or Tiritiri Matangi Island). Frequency ranged from: never before, less than once per year, one-three times per year, and more than four times per year. Respondents were grouped into novice visitors (those who visited less than once per year or had never visited a natural wilderness setting previously) and experienced visitors (those who repeatedly visit, i.e., visited over one or more times per year).

### **Measurement of Attitudes to the Environment**

Respondents were asked to indicate the degree to which they agreed or disagreed with each of the seven conservation attitude statements using a 5-point Likert scale. We investigated attitudes to the environment using a collection of statements about the environment and its conservation. The questions adopted in the final questionnaire were assessed for suitability in a pilot study of 100 visitors at one destination. Questions were assessed for their consistency to measure key dimensions about the existence and continued conservation of conservation lands (i.e., importance of existence of conservation lands, role of conservation estate, degree to which more conservation should be conducted).

Three of the six attitude statements were site-specific. These statements were designed to test whether visitors had opinions on the performance of conservation management at the site and thus whether they exhibited a degree of specific knowledge related to experience.

### Measurement of Pro-Environmental Behavior

There are two distinct views about how to measure pro-environmental behavior. Some researchers view the various behaviors, categorized under the umbrella of ecologically responsible behavior (e.g., recycling, use of alternative transport, purchasing biodegradable soap) as a single construct and aggregate them into a single measure. Others assume different but related types of ecological behavior, influenced by separate variables and measure them independently [review see 81]. We have chosen to measure behaviors separately since we are interested in the relationship between the natural environment and the expression of any of the behaviors.

Individuals answered eight questions about their behavior and environmental activities (Table 1).

Behavior was self-reported and respondents were asked to indicate the frequency of their own behaviors on 4-point scales from “never,” “sometimes,” “usually,” and “don’t know.” Although respondents were asked to indicate four categories of frequency, we report only the extremes of frequency of behaviors, never or always. The small number of respondents that answered they “did not know” for some of these behaviors was coded as “never.” This is because we wanted to investigate who knowingly acts in an environmentally responsible manner.

Table 1. Pro-Environmental Measures

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I recycle bottles, cans, paper
I compost garden/food waste
I use alternative forms of transport to reduce car use
I avoid purchasing from companies who I am aware are not environmentally friendly
When purchasing price overrides environmental ethics
I use soaps and detergents that are friendly to the environment (i.e., biodegradable)
I read labels to assess whether products are environmentally friendly
I purchase products that are made of, or packaged in, recycled materials

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## Data Analysis and Results

Multivariate analysis of variance (MANOVA) was performed to test the relationships between experience and conservation attitudes, and experience and environmentally responsible behaviors. Post hoc analyses using Tukey's LSD test were performed to assess the differences between the sites and between experienced and novice visitors.

### Conservation Attitudes by Experience of Visitor

Results support the proposition that frequent or experienced visitors of the natural environment are likely to exhibit stronger positive attitudes to the environment and its conservation than novice visitors do (Table 2). There were significant differences in attitudes between the two visitor groups for all three of the general attitudes (i.e., not related to site) with experienced visitors holding stronger conservation attitudes than novices. However, experienced visitors show no difference to novice visitors where attitudes relate to the site surveyed.

### Conservation Attitudes by Site

The second proposition suggests that frequent or experienced visitors of more natural settings are likely to exhibit more positive attitudes to the environment

Table 2. Conservation Attitudes by Experience of Visitor<sup>a</sup>

Degree to which you agree with this statement	Significance
I believe conservation should be funded through taxes	$p < 0.001$
It is important for people to participate in conservation	$p < 0.01$
I would like to see more conservation done	$p < 0.001$
<b>Site-specific attitudes<sup>b</sup></b>	
This site <sup>c</sup> shows people and conservation can mix	NS
This site <sup>c</sup> is an example of effective conservation management	NS
It is important for this place <sup>c</sup> to exist	NS

<sup>a</sup>Comparison of novice versus experienced visitor's attitudes to the statements using a 5-point Likert scale on a frequency scale, where 1 = strongly disagree, 3 = neither agree or disagree, and 5 = strongly agree;  $n = 244$ . <sup>b</sup>Statements that relate specifically to the site being surveyed. <sup>c</sup>The questionnaire specifies the site name (Tiri tiri or the Zoo).

and its conservation than those who are experienced visitors to less natural or constructed sites but this is poorly supported by results (Table 3). Thus, degree of naturalness of the site does not appear to affect general conservation attitudes. Significant differences in attitudes were found between sites for only one of the three general conservation attitudes in that visitors to the more natural site agree more strongly than visitors to the constructed site that the Government should fund conservation through taxes. However, the MANOVA analysis reveals significant differences in attitudes related to the effectiveness of the site in terms of conservation. Experienced visitors to the more natural site agree more strongly than their counterparts at the constructed site, that the site is an effective example of conservation. Experienced visitors to the natural site also agree more strongly that the natural site shows people and conservation can mix and it is important for the site to exist.

Table 3. Conservation Attitudes by Site<sup>a</sup>

Degree to which you agree with this statement	Significance	Site difference <sup>b</sup>
I believe conservation should be funded through taxes	$p < 0.001$	C < N
It is important for people to participate in conservation	NS	C = N
I would like to see more conservation done	NS	C = N
<b>Site-specific attitudes<sup>c</sup></b>		
This site <sup>d</sup> shows people and conservation can mix	$p < 0.001$	C < N
This site <sup>d</sup> is an example of effective conservation management	$p < 0.001$	C < N
It is important <sup>d</sup> for this place to exist	$p < 0.001$	C < N

<sup>a</sup>Comparison of the extent to which visitor's at two sites (natural site and the constructed site) agreed with the statements, using a 5-point Likert scale, where 1 = strongly disagree, 3 = neither agree or disagree, and 5 = strongly agree;  $n = 244$ . <sup>b</sup>Site difference refers to the relationship between the sites (i.e., C < N; constructed site visitors agreed significantly less with that statement than the natural site visitors). <sup>c</sup>Statements that relate specifically to the site being surveyed. <sup>d</sup>The questionnaire specifies the site name (Tiritiri Matangi or the Zoo).

### Frequency of Pro-Environmental Behaviors in the Sample

Environmentally responsible behaviors are regular behaviors of a minority of people sampled and the overall frequency varied markedly between the behaviors (Table 4). The most frequent behavior is recycling paper or glass (40 percent of the sample). A smaller but significant proportion of the sample (e.g., from 28 percent to 18 percent) use biodegradable soaps, read labels of goods to assess environmental friendliness, compost household waste, and avoid companies who are not environmentally responsible. Very few people (e.g., fewer than 15 percent) always purchase on the basis of environmental ethics rather than price, or use alternative transport to reduce personal vehicle use.

### Frequency of Pro-Environmental Behavior by Experience of Visitor

Results (Table 5) support the third proposition that experienced or frequent visitors of the natural environment display more pro-environmental behaviors than novice visitors. Novice visitors perform six of the eight behaviors significantly less frequently than experienced visitors (Tukey's LSD).

Table 4. Percentage of the Sample from Both Sites Who Always Perform These Behaviors

Behavior	Rank	Always	Original sample	Proportion of original sample
Recycle	1	251	612	41%
Use biodegradeable soaps	2	171	615	28%
Read labels	3	158	615	26%
Compost	4	154	615	25%
Use recycled packaging	5	147	615	24%
Avoid companies	6	110	615	18%
Purchase on environmental ethics rather than price	7	81	615	13%
Use alternative transport	8	56	614	9%

Table 5. Frequency of Pro-Environmental Behavior by Experience of Visitor<sup>a</sup>

Behavior	Use difference	Significance	<i>n</i>
Recycle	n < e	$p < 0.001$	300
Use biodegradeable soaps	n < e	$p < 0.001$	250
Read labels	n < e	$p < 0.001$	250
Compost	n < e	$p < 0.001$	261
Use recycled packaging	n < e	$p < 0.001$	235
Avoid companies	n < e	$p < 0.001$	211
Purchase on environmental ethics rather than price	n = e	NS	168
Use alternative transport	n = e	NS	217

<sup>a</sup>Comparison of novice versus experienced visitors on a frequency scale, never – always, where n = novice user, e = experienced user.

No differences were found in the frequency with which novices or experienced visitors engaged in the other two behaviors (e.g., used alternative transport or purchased goods based on price rather than environmental ethics).

### Frequency of Pro-Environmental Behavior by Site

Results (Table 6) provide only partial support for the fourth proposition, that experienced visitors of more natural environments are likely to exhibit more pro-environmental behavior than experienced visitors to the constructed site. Of the eight behaviors assessed, only three were significantly different for the two sites (use of biodegradable soaps, use of recycled packaging, and frequency of purchase based on environmental ethics rather than price). Experienced visitors of the natural site displayed more pro-environmental behaviors than experienced visitors to the constructed site.

## DISCUSSION

Pro-environmental behaviors are not a common behavior of the majority of the people sampled and nor are they engaged in equally. Some behaviors (e.g.,

Table 6. Frequency of Pro-Environmental Behavior by Site (Natural versus Captive)<sup>a</sup>

Behavior	Significance	Site difference <sup>b</sup>	<i>n</i>
Recycle	NS	C = N	300
Use biodegradeable soaps	$p < 0.04$	C < N	250
Read labels	NS	C = N	250
Compost	NS	C = N	261
Use recycled packaging	$p < 0.001$	C < N	235
Avoid companies	NS	C = N	211
Purchase on environmental ethics rather than price	$p < 0.001$	C < N	168
Use alternative transport	NS	C = N	217

<sup>a</sup>Comparison of visitors to natural site (N) and the constructed site (C) on a frequency scale, never – always, where n = novice user, e = experienced user. <sup>b</sup>Site difference refers to the relationship between the sites (i.e., C < N; constructed site visitors showed significantly lower frequency of that behavior than natural site visitors).

recycling) are more frequently observed among the sample while others are much rarer. Opportunity to participate appears a moderating influence in that recycling is a common municipality supported option for those sampled, whereas public transport in Auckland where the sample was taken is poor. These observations and the other results suggest that environmental behaviors may not be a single construct and therefore may be under the influence of different factors.

Our proposed model that relates both conservation attitudes and environmentally responsible behavior to experience of the natural environment receives considerable support. In terms of environmentally responsible behavior our model proposed that frequent direct experience of the natural environment is related to more environmentally responsible behavior. Results support this in general. This is consistent with the only other study known to investigate the relationship between outdoor recreation and pro-environmental behavior, Nord et al. [73], who report that frequency of visits to forest areas and the use of forest recreation activities are moderately associated with pro-environmental behavior.

The link between experience of the environment and pro-environmental behavior suggests frequent visitors gain knowledge and understanding and form attitudes about their effect on the environment and the need to sustain it. Gutman



[100] proposed that values can be translated into choices between objects and that consumers create arrays of products that are optimal in providing desired consequences that will provide value satisfaction. So we might expect that strong environmental values should influence the type of goods purchased. For example, an experienced visitor of the natural environment may choose to purchase products that minimize effects on the environment, by choosing products from entirely different product classes that do not affect waterways and reduce the need for land-fills (e.g., biodegradable soap powder and recycled paper).

The fact that experienced visitors did not perform all the behaviors does not seem related to the type of purchase (i.e., low involvement purchases [96, p. 171]). Only two behaviors were not linked significantly to experience of the visitor. These were the least frequent behaviors exhibited by the sample (e.g., use of alternative transport and price) and hence lack of significance may reflect low sample sizes. Thus, it appears that purchasers who are aware of environmental issues may be more involved purchasers of these basic commodities than those consumers who do not understand the relationship between their behavior and deleterious effects on the natural environment. This is supported by the fact that many report reading labels to evaluate a product's environmental safety, suggesting people process information to assess alternatives. The repetition of experience of the natural environment may increase the visitor's familiarity with environmental issues that may promote the search for "green" products.

Frequent direct experience of the natural environment is also linked to stronger general attitudes to conservation. We feel this may be because frequent or experienced visitors of the natural environment gain knowledge and understanding which affects their attitudes on the importance of conservation. This lends support to the notion that direct experience and repetition is an important influence on attitude and behavior [54, 56, 72]. It also supports results in recreation studies where outdoor recreation participants are more likely to hold strong beliefs about environmental issues than non-participants, who may rely on non-personal experiences such as television or newspapers to form attitudes [37]. Participation in outdoor recreation is a stronger predictor of attitudes toward forest clear-cutting than social and demographic characteristics [101] and is associated with more negative attitudes toward natural resource (oil and gas) development as participation level increases [102].

The link between experience and general conservation attitude also lends support to the concept that experience leads to the development of a concept of value [76] and, in this case, to strong attitudes to sustain the natural environment.

However, the relationship of attitude with experience does not appear to be moderated by the type of experience normally chosen as we proposed in our model. This is in contrast to the findings of Tarrant and Green [37] who demonstrated that participation in appreciative outdoor recreation activities (i.e., nature/bird watching, backpacking) mediates the environmental attitude-behavior relationship, while participation in consumptive (i.e., hunting, fishing) did not

appear to have an effect. Frequent experience of more natural sites seems to have little effect either on environmentally responsible behaviors or conservation attitudes. The degree of naturalness of the preferred type of experience only affected some types of behavior, which may suggest that pro-environmental behaviors are not part of a single construct under the influence of the same factors.

However, the type of site did influence site-specific attitudes. These attitudes are an indicator of perceived effectiveness of the site in terms of conservation. Experienced visitors of the more natural site were consistently stronger in their beliefs that it was a good example of conservation management, that it should exist and that the site showed people and conservation should mix. Whereas visitors to the constructed site were significantly less inclined to agree with these statements and a small proportion of respondents had highly negative perceptions on these dimensions. This suggests that people develop knowledge based on experience which leads to more informed opinions about their experience.

We hypothesized that the more natural the experience normally engaged in, the more we might expect the individual's behavior to be environmentally responsible. Our results only partially support this, which might be because social and physical environmental factors may constrain the expression of behavior despite strong intentions [97]. While the whole sample had access to recycling programs, not all programs were easily accessible. Many of the sample had access to curbside recycling while a small percentage had access to drop-off point recycling depots, which represent more limited opportunities to recycle. The lack of relationship between type of site and pro-environmental behavior could also be a reflection of perceived behavioral control, the perception of the ease or difficulty in performing a behavior [103]. The notion of perceived behavioral control maintains that behaviors which are more difficult (i.e., less under one's control), will be performed more commonly among people who have strong positive attitudes. Behaviors that are easier to perform will be common among people who have moderate or weak positive attitudes together with people who hold strong positive attitudes [91]. Environmental concern predicted recycling when the amount of effort required was relatively high, but not when the amount of effort was lower or when incentives were added [91].

Furthermore, according to the theory of rational intentional behavior an individual's behavior is related to perceived consequences and the strength of belief in these consequences [97]. If the consequences of human behavior on the environment seem remote because of scale and complexity [98], then our behavior may seem inconsequential and we may be less inclined to act despite our attitudes toward the environment.

Generally low participation rates in pro-environmental behaviors despite positive attitudes toward conservation of the natural environment suggest that people still do not link the natural environment to their everyday behaviors despite extensive media attention to increasing awareness of environmental issues.

Although we did not test this linkage, several papers confirm the weakness of the association between environmental attitudes and pro-environmental [48, 104-106]. It appears that progress to increase pro-environmental behavior may be slow, if voluntary mechanisms are followed.

Waiting for people to realize the consequences of their behavior voluntarily may be too slow, since it is clear that as individuals we hardly relate to the immense scale and complexity of degradation occurring [98]. Combine this with the fact that it will take the collective action of entire communities to create the change needed to reduce the speed and intensity of degradation, mandatory interventions to induce pro-environmental behavior may be the only option.

## CONCLUSIONS

Experience affects behavior and certain attitudes toward the environment. Encouraging people to use the natural and native environments may ultimately lead to greater participation in pro-environmental behaviors.

Public participation in the natural environment should also be seen as leading to positive outcomes for its conservation. Instead of the current method of dislocating people from functioning native ecosystems, encouraging sensitive use might ensure longer term sustainable protection. Experienced visitors in this study reflected more positive attitudes to conservation than novice visitors, which suggests their experience allows them to develop a sense of value for natural systems. As the literature also suggests lack of experience is more likely to lead to weak attitudes toward conservation and no real sense of the natural environment's value. Confirmation of these results can be achieved by comparing the behavior of people in "green" developments where functioning native ecosystems are integrated as components of constructed environments. Unfortunately this study is unable to be performed in New Zealand or it would seem in many developed countries [107] as few urban developments follow these principles.

However, it is of concern that participation rates in many seemingly basic pro-environmental behaviors are quite low. This may relate to the perceived ease of performing the behaviors. Therefore to increase pro-environmental behavior policy makers might be tempted to focus on reducing impediments to each of the separate behaviors in isolation. While this approach is a beginning, it completely disregards ecological theory that humans are part of the same ecosystem as animal and plants and are interdependent [34]. All behaviors affect the environment and must be seen as related. A more effective focus may lie in educating people about our interdependency on the environment and the related environmental outcomes of behaviors. Experiencing natural ecosystems reinforces these pro-environmental behaviors and hence there is a need to encourage people to become more involved in their local environments.

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