CROSSING THE BOG OF HABITS:
MEASURING AN EXHIBIT’S EFFECTIVENESS AT PROMOTING ENVIRONMENTALLY RESPONSIBLE BEHAVIOR

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ABSTRACT
Can a game increase visitor’s interest in incorporating environmentally responsible behaviors in their daily lives? An evaluation of the Brookfield Zoo’s Bog of Habits exhibit finds that visitors who play the Bog of Habits are more interested in increasing the frequency with which they do time intensive environmental behaviors than Zoo visitors who do not play the game.

INTRODUCTION
The purpose of environmental education is the creation of a society capable of resolving environmental issues (Monroe and Kaplan 1988). Many people believe that zoos are ideal places for environmental education (AZA in press), in fact developing pro-environmental behaviors among visitors may be the most important role of a zoological facility (Stoinski 1999). In keeping with this idea, the Brookfield Zoo, near Chicago, Illinois, created the Quest to Save the Earth, an outdoor exhibit that serves as the exit experience for the Zoo’s primate house.

The Quest encourages visitors to explore and adopt new environmental behaviors through a series of four challenges. The first of these challenges, the Bog of Habits, addresses the daily choices individuals make and the affect of these choices on the environment. Visitors can cross the Bog of Habits, a recycled rubber surface, by stepping on a series of stones (see Image 1). Each
stone is inscribed with a different behavior, and with the assistance of a guidebook and a spinner, visitors learn about the possible impacts their choices can have on the environment.

Numerous studies cite the potential of zoos to positively influence their visitors’ environmental knowledge, attitudes, and behaviors. However, this potential has not been validated through empirical research (AZA in press). This study documents the effectiveness of the Bog of Habits at encouraging visitors to adopt environmentally responsible behaviors and answers the following questions:

1. Does playing the Bog of Habits lead to increased interest in performing environmentally responsible behaviors? If so, does this interest persist over time?
2. Does playing the Bog of Habits have an effect on visitors’ immediate likelihood to take pro-environmental action?
3. Will visitors who play the Bog of Habits retain the message of the Quest to Save the Earth?

To answer these questions, an on-site survey and a direct action measurement were administered in the summer of 2001 and a phone survey was conducted several months later.

RESEARCH METHODS

The on-site survey measured the ability of the Bog of Habits to increase visitors’ interest in engaging in environmentally responsible behaviors. Three hundred and fifty-two Brookfield Zoo visitors were surveyed – 164 immediately after playing the Bog of Habits (the Bog group) and 186 who had never played any part of the Quest to Save the Earth including the Bog of Habits (the Control group). Visitors were asked a series of questions about their demographics, past environmental behaviors, environmental attitudes, and interest in performing environmental behaviors in the future. A five-point Likert scale was used throughout the survey with one representing the low end of the scale and five representing the high end. The data was analyzed using factor analysis, t-tests, ANOVA, and Chi-squared tests.
To compliment the behavior self-assessment, an experiment measuring brochure pick-up frequencies was conducted. This experiment sought to determine whether Zoo visitors who played the Bog of Habits were more likely to take immediate pro-environmental action. Upon completing the survey, each respondent was given a color-coded coupon redeemable for a brochure containing information on how to help the Earth. Coupon return rates were recorded, and results were analyzed using Chi-squared tests.

The follow-up phone survey was designed to measure the effects of the game after several months had passed. A sub-set of visitors from the Bog and Control groups were contacted four to six months after their summer Zoo visit and were asked questions about their Zoo visit as well as a set of questions from the summer survey. This data was analyzed using coding categories and t-tests.

RESULTS

On-site Survey

The on-site survey showed that the Bog and Control groups were similar in terms of demographics, past behaviors, and attitudes. In terms of their interest in future behaviors, the Bog and Control groups were again similar, with one notable exception. From the list of behaviors on the survey, three categories emerged through Factor Analysis - Savings in the Home, Energy Conservation, and Time Commitment. Savings in the Home included “buy refills for cleaners or soaps” and “pack lunch in a lunchbox” while actions in the Energy Conservation category included “reduce car errands” and “line dry laundry.” Both of these categories had relatively high means, and in both categories there was no a significant difference between the Bog and Control groups (see Table 1).

It was in the third category, Time Commitment (see Table 1) that a significant difference between the groups emerged. This category included behaviors that require an investment of time.
or knowledge such as “composting” or “writing letters to congressional representatives.” As seen in Table 1, the means for this category were lower than for the other two future behavior categories. However visitors who played the Bog of Habits expressed a significantly higher interest in increasing the frequency of these Time Commitment behaviors than did the Control group.

Brochure Pick-up Study

The brochure pick-up study gives a direct, objective measure of visitors’ interest. This study found that visitors who played the Bog of Habits were nearly four times as likely to redeem their coupons for a brochure about how to help the Earth than those who had not played the game (see Table 2).

Phone Survey

In the phone survey, the higher interest in Time Commitment behaviors expressed by the Bog group in the on-site survey had disappeared. In fact, the phone survey scores of the Bog group were identical to those of the Control group, whose level of interest did not change between the summer and phone surveys (see Chart 1).

Despite the decreased interest in Time Commitment behaviors, the Bog group almost unanimously cited the Bog of Habits as the place at the Zoo they had learned about their choices, and their relationship to the Earth. Many respondents from the Bog group were also able to articulate the message of the Quest to Save the Earth, a surprising result given the lapse of several months since their Zoo visit.

DISCUSSION

The following key findings emerged from this study:

- Playing the Bog of Habits increases visitor’s interest in environmentally responsible behaviors, but this interest decreases over time.
- Playing the Bog of Habits prompts visitors to take action.
Messages from the Bog of Habits remain salient over time.

The two surveys and the brochure pick-up study support the hypothesis that playing the Bog of Habits increases visitor’s interest in performing environmental behaviors. The Bog group showed a higher level of interest in time commitment behaviors when surveyed at the Zoo. This higher level of interest was not seen several months later during the phone survey. In fact, the Bog and Control group scores were identical to the Control group scores which did not change from the on-site to the phone survey. This return to baseline indicates that the intervention, playing the Bog of Habits, caused the increased interest (Geller et al. 1992). While it is disappointing that this interest did not last, it is unlikely that the effects of this short experience would last over a period of several months. What was promising was that the higher interest led to immediate pro-environmental action as four times as many people from the Bog group redeemed their coupon for a brochure on how to help the Earth. It was impressive that this short game resulted in a significant behavioral difference between the two groups.

The ability of the Bog group to recall and articulate the message of the Bog of Habits – that individual choices can impact the Earth – several months after their visit to the Zoo shows that a behavior change exhibit can leave an impression on visitors. However, the drop-off of interest demonstrates once again that simply knowing that individual’s choices can help Earth does not necessarily lead to action. The recall of the message but the decline in interest suggests that the Bog of Habits is effective as a short-term intervention but that in the absence of a follow-up intervention, the motivational effects of the exhibit are lost. Development of effective follow-up interventions is an exciting new area for environmental educators to explore.
CONCLUSIONS

This study has implications for zoos and aquariums as well as other non-formal environmental education sites. The findings support the following conclusions:

- Zoo exhibits can influence visitors’ interest in environmentally responsible behaviors.
- An exhibit can motivate zoo visitors to take environmental action.
- Behavior change cannot be expected without follow-up interventions.

This study of the Brookfield Zoo’s Bog of Habits exhibit shows that zoo visitors are amenable to learning about the environment and that behavior change can be affected in a zoo setting. In order to capitalize on this interest, zoos and other non-formal centers should present educational experiences that motivate visitors to take environmental actions.

This study has implications for the environmental psychology and environmental education communities. It shows that a short, interactive game can actually influence people’s behavior. It also provides a model for the development and evaluation of other interactive, educational activities. Lastly, it highlights the importance follow-up interventions in maintaining interest and creating durable behavior change.

REFERENCE LIST

Association of Zoos and Aquariums. Multi-institutional research project literature review. Institute for Learning Innovation, Annapolis, MD. in press.


Table 1 – On-site Survey Scores for Interest in Future Behaviors (Scale of 1-5)

<table>
<thead>
<tr>
<th></th>
<th>Bog Group</th>
<th>Control Group</th>
<th>p-value</th>
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<tr>
<td>Savings in the Home</td>
<td>4.14</td>
<td>4.02</td>
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<tr>
<td>Energy Conservation</td>
<td>3.69</td>
<td>3.49</td>
<td>.071</td>
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<tr>
<td>Time Commitment*</td>
<td>3.23</td>
<td>2.87</td>
<td>.000</td>
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Table 2 – Brochure Study Coupon Return Rates

<table>
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<tr>
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<tbody>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td>Bog Group (n = 194)</td>
<td>11.3% 88.7%</td>
</tr>
<tr>
<td>Control Group (n = 205)</td>
<td>3.4% 96.6%</td>
</tr>
</tbody>
</table>
Chart 1 – Interest in Increasing Time Commitment Behavior (On-site and Phone Surveys)

* no statistical difference