

Understanding Motivations and Barriers to Effect Conservation Behavior Change

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Fig. 1. Guests interacting with one of the giant sandboxes, a central feature of the Tropical Beach Party event.

For over 10 years, the Minnesota Zoological Gardens (hereafter “Minnesota Zoo”) in Apple Valley, Minnesota has hosted a family-centered event called “Tropical Beach Party.” Held from mid-February to mid-March, the event is intended to provide a fun tropical respite for families during these cold winter months. Central features of the event are two giant sandboxes in which children can play. In recent years the sandboxes have been located in our *Tropical Aviary*, an indoor exhibit featuring animals found in tropical regions across the world (fig. 1) and in our *Discovery Bay*, an indoor exhibit featuring marine creatures. The programming for the event includes story times, close encounters with ambassador animals – such as a tropical reef dive show and Hawaiian monk seal demonstration – as well as a small pop-up exhibit (i.e., temporary educational display), designed to educate guests on the impacts of plastics on the environment and to provide an opportunity for guests to engage in a specific conservation behavior related to reducing plastic use.

In the past, the pop-up exhibit focused on providing educational activities, such as observing animal biofacts (like a sea turtle shell) and providing a fun activity for kids, such as a craft or coloring sheets. In 2018 the planning committee for this event, consisting of staff from conservation, education, events,

guest services, and marketing, decided to focus the activities at the pop-up exhibit on plastics and water quality in an attempt to better achieve our mission of connecting people, animals, and the natural world to save wildlife. Specifically, we wanted to motivate guests to take a pledge to reduce their use of plastic bags. We selected this conservation behavior (i.e., plastic bag use) due to growing research suggesting that plastic bag pollution is a major environmental threat and because rising numbers of sea turtles are consuming this plastic pollution.¹ We modeled our activities on Houston Zoo’s successful campaign to get people to use reusable shopping bags.

For 2018, the pop-up exhibit had the goal of encouraging conservation behavior change as well as increasing knowledge and understanding of the impact of plastics on the environment. Due to the interactive nature of the pop-up exhibit, and the goal, we only used the exhibit when there were education staff members or volunteers present to guide guests through the activities. There were eight different activities:

1 Katharine E. Clukey, Christopher A. Lepczyk, George H. Balazs, Thierry M. Work, and Jennifer M. Lynch, “Investigation of Plastic Debris Ingestion by Four Species of Sea Turtles Collected as Bycatch in Pelagic Pacific Longline Fisheries,” *Marine Pollution Bulletin* 120, no. 1–2 (2017): 117–125; STAP (Scientific and Technical Advisory Panel), “Marine debris as a global environmental problem: Introducing a solutions based framework focused on plastic. A STAP information document” (2011).

Name of Activity	Description of Activity
Biofact demonstration	To allow people to have a tactile experience and connect with non-living sea turtles, we had either a sea turtle shell (i.e., biofact) or a stuffed Hawksbill sea turtle. Staff or volunteers instructed visitors to the pop-up exhibit to touch the shell or the turtle like it was a live animal. Staff and volunteers shared information on the endangered status of the turtles, along with the major threats, which include plastic ingestion or entanglement.
Plastic bag jellyfish	This activity demonstrated how sea turtles could confuse plastic bags as jellyfish, which are their favorite foods. Staff/volunteers have containers of water with fake/plastic bag jellyfish as well as pictures of sea turtles eating jellyfish vs. eating plastic bags. Staff/volunteers also talked about the connection to microplastics and the fact that plastics do not decompose, and they made the connection to avoiding using single-use plastic like grocery bags.
Pack a lunch	For this activity, participants were asked to choose the worst, better, and best options for packing a lunch. The options included single-use to reusable options, and was easy for kids and adults.
Plastic soup	This activity demonstrated the size of microplastic debris referred to as “plastic soup” in the North Pacific Gyre, which is estimated to be approximately the size of 67 states of Minnesota. In addition to a picture showing the size of microplastic collection in one part of the ocean compared to the state of Minnesota, we had an additional infographic explaining how plastic arrives in the ocean.
Pledge	We asked individuals to take a pledge to use reusable shopping bags (fig. 2).
Mural	After taking the pledge to use reusable shopping bags, we asked the individual to stamp a tropical mural on display during the event in order to publically showcase the number of people taking the pledge and making a commitment to participate in this conservation behavior (fig. 3).
Kids stamp	After kids were able to explore some of the activities at the pop-up exhibit, the staff or volunteers asked them a question about their learning, or helping remind their adults to bring reusable bags, etc., to which they then got a stamp on their arm with nontoxic ink.
Coloring sheet	We provided coloring sheets depicting sea turtles, jellyfish, and other ocean creatures, as well as markers for kids to color while at the table, or to take home and color (fig. 4).



Fig. 2. Pledge for guests of the Tropical Beach Party and the pop-up exhibit to take, committing to using reusable bags while shopping for the next three months.

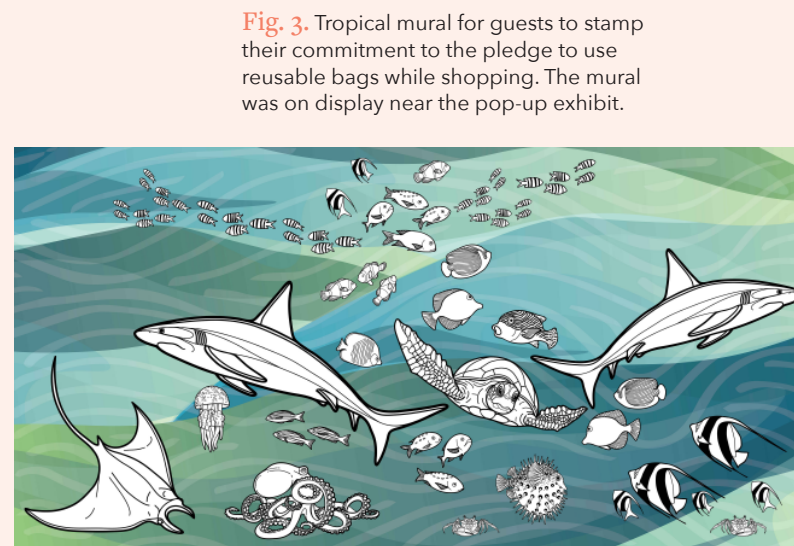


Fig. 3. Tropical mural for guests to stamp their commitment to the pledge to use reusable bags while shopping. The mural was on display near the pop-up exhibit.



Fig. 4. Youth engaged with coloring sheets on the pop-up exhibit.

In addition to providing the pop-up exhibit, we gave out 200 free reusable tote bags to guests each day. Guests could also purchase additional tote bags from the Minnesota Zoo's gift store at a 25 percent discount during the Tropical Beach Party, and volunteers passed out turtle tattoos throughout the event.

To determine the effectiveness of this pop-up exhibit on conservation behavior (i.e., limiting plastic bag usage), we conducted a survey immediately after people interacted with the exhibit and a follow-up survey sent via email approximately three months after the event. Grounded in community-based social marketing and general social science theories of behavior change (such as the theory of planned behavior),² we focused our evaluation on better understanding people's motivation and barriers to their intention to take action, and in their actual, self-reported behavior change. We demonstrate that even a short-term exhibition can have a direct impact on people's willingness to participate in behaviors focused on reducing or mitigating environmental threats and actual self-reported participation in those behaviors.

Evaluation Plan

As capacity allowed, we stationed volunteers (adults or teens) near the pop-up exhibit with an iPad®. The survey questions were administered online via Survey Monkey and a shortcut link loaded onto the iPads®. The questions were designed by education staff and our evaluation and research specialist. When the volunteers were present, they invited guests who visited the pop-up exhibit and completed a pledge to reduce their plastic consumption to take a survey. Participants were asked, "Would

you mind taking a quick survey on plastic use?" as the prompt to complete the survey. The pop-up exhibit was only available when there were staff or volunteers able to be present with the display to help interpret and interact with the guests. When the pop-up exhibit was not present, guests took the control survey administered by volunteers. We included the control survey to help us determine if engaging with the pop-up exhibit contributed to any self-reported changes in behavior, versus a general visit to the Minnesota Zoo during Tropical Beach Party.

As a part of the survey, participants were asked if they would be willing to complete a follow-up survey in 90 days. If the participants agreed to the follow-up survey, they were asked to provide their email address. In total, 51 initial survey respondents (out of 136) gave their emails to be included in a follow-up survey, as did 63 of the control-survey respondents (out of 100). Additionally, a survey focused on taking the pledge and understanding plastic bag behavior was posted on the Minnesota Zoo website to further engage people who may not have the opportunity to visit; 101 people completed it and 97 provided their email for the follow-up survey. Our evaluation and research specialist compiled the results from the surveys into a summative report for all staff to review and reference for future planning. The key findings are summarized below.

Evaluation Results

In total, 100 people completed the control survey, 136 completed the initial survey, 38 people completed the post-survey, and 101 people completed the online website survey (which included asking people to take a pledge; the individuals completing the survey, though, may or may not have interacted with the pop-up exhibit prior to completing the survey). To help us determine the role of the

2 Doug McKenzie-Mohr, *Fostering Sustainable Behavior: An introduction to Community-Based Social Marketing* (Gabriola Island: New Society Publishers, 2011); Icek Aizen, "From Intentions to Actions: A Theory of Planned Behavior," in *Action Control*, eds. Julius Kuhl and Jürgen Beckmann (Berlin and Heidelberg: Springer, 1985), 11–39.

Minnesota Zoo in changing behavior, if any, we asked online survey takers if they had visited the Minnesota Zoo. A total of 23 percent of online survey respondents indicated that they had visited the Minnesota Zoo and that their experience was part of the reason that they decided to take the pledge to use reusable shopping bags, further supporting the benefit of the pop-up exhibit in prompting behavior change.

Overall, our key findings are summarized below:

- participants reported an increase in their likelihood of using reusable shopping bags every time they shop
- 35 percent of survey respondents indicated that visiting the Minnesota Zoo, and their experience once there, was a positive motivator to using reusable shopping bags
- 100 percent said they were extremely likely (92 percent) or likely (8 percent) to continue the conservation behavior
- 82 percent of participants indicated that they had encouraged their family and friends to go plastic-bag-free.

To help guide future pop-up exhibits and behavior change campaigns, we asked survey respondents to identify barriers to reusable bag usage. Respondents indicated the following as potential barriers: remembering to use them; preferring to have plastic bags for other purposes; and salesclerks bagging items too quickly. In addition to asking about barriers, we asked questions to help identify strategies that motivated individuals to use their reusable bags while shopping. We learned that many people were motivated by a desire to protect ocean animals and reduce pollution. Respondents also indicated that Minnesota Zoo's commitment to reducing plastic was a motivator, suggesting the important role of the museum and pop-up exhibit at driving behavior change.

Knowing potential motivators and barriers to engaging with the targeted conservation behavior is useful for designing future temporary (or permanent) exhibits as it allows us to include strategies to increase the benefits and reduce the barriers to performing the desired conservation behavior. In fact, in 2019, we used the barrier of remembering to use the bags as inspiration for a door tag with a reminder message, in hopes of helping to eliminate this barrier to plastic bag reduction. This same strategy can be applied in a variety of temporary or permanent exhibitions focused on encouraging people to participate in conservation behaviors.

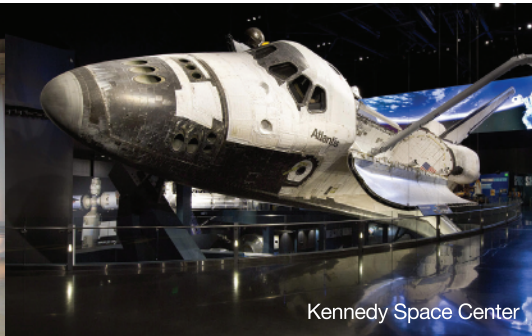
Things to Think About

Through evaluation and debriefing conversations, we came up with a number of tips to help in developing these types of pop-up exhibit planning processes:

Developing the pledge. We found that a large number of participants did not actually take the pledge, as they already used reusable bags. If reducing single-use plastic is a larger goal for the pop-up exhibit, staff could offer a new pledge focused on reducing general use of plastics (e.g., microplastics, straws, packaging, etc.). Alternatively, the pledge could focus on getting people who already use reusable bags to use them all of the time (this would need to be designed to screen out people already using them all of the time). This same process applies to conservation behavior beyond plastic use, and is something exhibit planners would want to consider when designing for behavior change. It is important to have a baseline understanding of visitors to know how to continue to engage them once they have moved beyond an entry-level behavior of interest. Having a



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stepwise progression of targeted behaviors, or planning for a stepwise progression, enables the exhibition to have a longer lifespan and continue to engage a diverse audience.

Demonstrating participation.

Another challenge we encountered was the use of the mural to demonstrate participation in the pledge. We intended for the mural to provide a way to visually represent the number of people taking a pledge to reduce plastic consumption. We selected this approach as research suggests that demonstrating how many other people are participating in a behavior can help to normalize it, and social norms are one effective method for driving behavior change. Unfortunately, having an interactive mural also opens up the possibility that people may draw or include additional content beyond the stamp indicating their pledge. In this example, youth were often coloring on the mural, which was viewed as detracting from the aesthetics of the event by some members of the Minnesota Zoo staff, including those involved in the original design and conceptualization of the mural. If a museum is planning to use an interactive display to motivate people to engage in behavior, some discussion or consideration should happen with regards to aesthetics or expectations of staff in order to determine the best approach. For instance, if a mural and stamp approach is selected, having a staff person or volunteer doing the stamping, or not having markers available with the coloring sheets, may reduce or eliminate the occurrence of things other than stamps on the mural.

Prioritizing for behavior change.

When planning an exhibition (temporary or permanent) focused on behavior change, it is important to clearly determine what the goal will be. If there are multiple competing priorities, such as “fun!” and “behavior change,” it is important that all staff members involved in planning and implementing the exhibition are aware of the ways the competing priorities may interact (such as having a mural that kids may draw on in addition to adults using it for a pledge), and what planning for success might look like in these situations. Having these candid conversations up front may help to ensure that the goals are met, while also troubleshooting things that may happen that are outside of the identified goals and priorities.

Concluding Thoughts

We found that a short-term exhibition can be effective at demonstrating and engaging guests in environmental threats and the conservation behaviors they can take to mitigate those threats. A short-term exhibit can often be easily modified for use at public tabling or pop-up events offsite, making it broadly applicable as a strategy for a variety of museums and organizations. Further, we demonstrated that a pop-up exhibit that had a focus on environmental threats was successful at achieving the goal – while not detracting from a larger event at the museum that was designed to be fun and family-focused.

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