

Summative Evaluation Of The Shark Encounter Exhibit, Sea World Of California

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Description of the Exhibit

The focus of this evaluation was the Shark Encounter exhibit at Sea World of California. The Shark Encounter exhibit, which opened June 1992, encompasses approximately two acres. The design concept was to display the largest collection of sharks in the world. Visitors are transported to the "tropics" to view sharks from above, and then venture into the sharks' environment as they travel through an acrylic tube placed on the bottom of the habitat.

The Shark Encounter exhibit includes three parts: a shark-filled lagoon enclosed by an 8,000-square-foot mural, a theater, and a 75-foot-long moving walkway inside an acrylic tube on the bottom of the sharks' habitat.

Purpose of the Evaluation

The primary focus of this evaluation was to determine the overall effectiveness, or success, of the Shark Encounter exhibit. Specifically, this evaluation looks at which elements within the exhibit were most successful in attracting and holding visitors' attention (i.e., the frequency with which visitors stop at each of the elements within the Shark Encounter exhibit and the time spent at each element). These elements include the graphics, the video, the aquariums, and the narrators. The evaluation also compared the interaction within visitor groups with children and groups without children to determine if there is a difference in the amount of time spent at each element within the exhibit.

A secondary focus of this evaluation was to assess if this exhibit has any educational impact on visitors (cognitive or affective). It addresses such questions as: Do visitors walk away from this exhibit knowing any more about sharks than before their visit? Do they have a better understanding and appreciation of sharks and their environment? Do they understand the need for conservation?

Evaluation Questions and Design

A participant-oriented approach, specifically, the post-occupancy evaluation model, guided this study. This type of summative evaluation combines direct observation with surveys and attempts to minimize some of the problems associated with obtrusive observations. This evaluation was designed to answer four primary questions:

- Who visits the Shark Encounter exhibit?
- Do the elements within the Shark Encounter exhibit attract and hold visitors' attention?
- What do visitors learn from the Shark Encounter exhibit?
- How does the exhibit design compare to standards found in the literature?

Methodology

Four data collection strategies were used to gather the information to answer the evaluation questions in this study. These strategies were (1) a review of existing information resources, i.e., marketing surveys; (2) observations of visitor behavior; (3) visitor tracking; and (4) visitor questionnaires. Data were collected from September to October 1994, on both weekdays and weekends and during morning and afternoon hours.

Before data were collected, data collectors completed a 2-day training session. To ensure the same methods were used by all data collectors, each trainee was given an instructional packet that contained a written protocol for each method, observational data collection sheets for each area within the exhibit, a visitor questionnaire, and instructions on how to use the stopwatches.

Selection of Subjects

In order to best reflect the typical population that visits the exhibit, both adults and children were tracked and observed. Only adults were selected for the interviews. When asking some of the questions (e.g., "What in particular did you like about this exhibit?" "What didn't you like?"), the interviewer allowed

everyone in the group to respond, regardless of age. Groups of adults and children who were visiting as part of a tour or field trip were not included in this study.

Instruments

Two types of instruments were designed to collect observation and tracking data. One was used to collect data on the percentage of visitors who glanced at or read each graphic in the entranceway to the exhibit and in the hallway leading to the underwater tube. Data collectors noted every time a visitor looked at a graphic by putting a hatch mark in the corresponding space on the data sheet. If a visitor actually stopped at a graphic, an asterisk or check mark was used instead. Because of the large numbers of visitors through these areas, it was difficult to get an accurate count; therefore, these data were intended to show trends, not specific numbers.

The second instrument was designed to collect varied data for each tracking/observation area. Each area had a separate data collection sheet that included a coded map of the area showing the locations of specific elements (e.g., graphics). The top section of these instruments was used to record general information (e.g., group composition, number of visitors in area), and the bottom section was divided into columns that correlated to the different sections or elements of the observation area. Data collectors used these columns to record visitor location every 15 seconds and to code visitor behavior, such as "r" for resting or "e" for engaging in interaction. There were also columns in which data collectors could note total time in exhibit and any additional comments. All comments were categorized and coded in the analysis phase of this study.

The questionnaire consisted of 18 questions, including forced choice, open-ended, and Likert scale items. The questionnaire was designed primarily to assess the educational (both cognitive and affective) effectiveness of the exhibit. Several marketing questions were also asked (e.g., Is this your first visit to Sea World? Is this your first visit to the Shark Encounter exhibit? Are you a Sea World pass holder?). Questions testing what visitors learned were generally true/false or multiple choice; questions assessing visitor attitude were generally Likert scale and open ended. Visitors were permitted to provide more than one answer for all open-ended questions. These were categorized and coded in the analysis phase of this study.

All instruments were pilot tested and, where necessary, modified two weeks prior to data collection. Further modifications were made to the tracking/observation instruments during the first week of data collection.

Observation Methodology

Observational and tracking data were collected to determine who visits the exhibit, which elements attract and hold visitors' attention, and how this exhibit compares to standards found in the literature. Because the Shark Encounter is large, I divided the exhibit into six observation areas, as noted below.

1. Entranceway (outside area of exhibit)
elements: graphics only
2. Lagoon/Tide Pool Room elements: aquarium, tide pool, narrator, graphics, shark tooth wall
3. Theater elements: aquarium, video, narrator
4. Hallway (leading to underwater tube) elements: graphics only
5. Moving walkway (underwater tube)
6. Exit room elements: aquarium, graphics, jaws, conservation pamphlets

Entranceway and Hallway

Visitors generally move quickly through these two areas—in the Entranceway because they are excited to enter the exhibit, and in the Hallway because it is on a slight downhill and they can hear the “heartbeat” playing in the underwater tube ahead. Therefore, it was not possible to use the same type of tracking and observation data collection methodology that was used in the other three areas. Instead, a survey-type methodology was used in which three data collectors noted on an observation sheet every time a guest glanced at or read a graphic. Derwin and Piper (1988) define “looking” as occurring when the visitor only gives the panel a cursory glance and goes no further than the title or the graphics. In “reading,” the visitor goes beyond the title and focuses on the text for more than 20 seconds. The term “glance” used in this study follows Derwin and Piper’s definition of “looking” but also stipulates that the visitors do not stop in front of the panel for more than 1 second. “Reading” was defined as stopping and focusing on the panel for at least 4 seconds. The lengths of time were shortened in this study because the majority of graphic panels in these two observation areas have very little text. This is particularly true for the Hallway, where all of the panels consist of a photograph or graphic and a single phrase or question, permitting visitors to easily read them as they walk by. The data collector closest to the entrance also counted the total number of visitors through the area (using a counter) during the observation period (observation period = 60 min). These data showed the percentage of visitors who look/stop at each graphic within both areas.

Lagoon/Tide Pool Room, Theater, and Exit Room

A data collector tracked every third visitor who entered the area and recorded visitor location every 15 seconds as s/he walked through the exhibit area. The data collector also recorded the duration of time the tracked visitor looked at a graphic, as well as whether the visitor interacted with a group member while looking at or reading the graphic. Space was available on the observation sheet for recording notable behavior or other comments. When the visitor left the area, the data collector noted the total time spent in the observation area, as well as demographic information on the visitor and number of visitors in the area (<10, =10, or >10).

Data collectors spent 40 minutes in each area before moving on to the next area. To ensure random sampling and to vary data collection, data collectors were asked to alter their routine every few days so they did not always go from one observation area to the next in the same order. When collecting data, great care was taken to ensure that visitors were not aware of the data collector's intentions.

Interview Methodology

Data collectors stood several feet outside the exit of the exhibit and randomly selected visitors for questioning by stopping every third visitor or visitor group leaving the exhibit. Questionnaire items were read aloud to participants and all comments were recorded on the instrument. If the item contained a Likert scale, a full-page version was shown to the participant. The survey generally did not take more than 5 minutes to conduct. None of the visitors taking part in the study received an incentive for participation; however, visitors were given a card with a toll-free telephone number on it in case they had any questions or wanted the answers to questions asked in the questionnaire.

Findings and Discussion

The total sample size for all three types of methodology combined was 3,178 visitors. Of these, 2,334 were observed in the Entranceway and Hallway; 666 were tracked and observed in the Lagoon/Tide Pool Room, Theater, and Exit Room; and 178 were interviewed. In this section, the results of this evaluation will be discussed as they relate to three of the evaluation questions that directed this study. The fourth evaluation question (How does the exhibit design compare to standards found in the literature?) will be integrated into the Conclusions and Recommendations section of this report.

Who visits the Shark Encounter exhibit?

The data provided by Sea World showed that approximately 326,037 people visited Sea World during the time the data collection for this evaluation took place, and that the majority of these visitors (48.7%) were from Southern California (14.4% were from San Diego). The random sampling in this study resulted in a higher percentage of adults interviewed than was present in the actual audience. However, the other two categories showed more similar percentages. As mentioned previously, children were not interviewed in this study.

Furthermore, the data provided by Sea World showed that 51.4% of visitors came in groups consisting of one or more adults with children, 48.6% came in groups of adults only; and that the mean party size was 3.3 people. In this evaluation, group composition was coded into six categories (single, couple, single+kids, couple+kids, multi+kids, multi w/o kids, and friends); thus, it was not possible to match exactly the data in this report with the marketing data. However, when the percentages for the two categories containing adults only were totaled and the percentages for the three categories containing adults and children were totaled, the data revealed that 48% of the visitors come to the park in groups of adults only; 46% come in groups of one or more adults with children, 5% come alone; and 1% come in groups of teens. (To derive these data, the friends category data were split into the appropriate age groups.)

The data provided by Sea World revealed a slightly higher percentage (67.8%) of those who said that they had been to Sea World before. In addition, only 9.4% of those surveyed in the market research study in the month of September said they were pass holders, compared to 15% interviewed for this study.

Do the elements within the Shark Encounter exhibit attract and hold visitors' attention?

Entranceway and Hallway. As mentioned earlier, it was difficult to track visitors in these two areas because visitors tended to move through them very quickly. Instead, data were collected on how many visitors glanced at, read, or disregarded each panel in each area (see Observation Methodology for definitions). It is important to note that even with three data collectors recording data, it was very difficult to obtain an accurate head count of those reading or glancing at each panel because of the speed and volume of visitors who walk through these areas [particularly after a show has let out (Entranceway) or the video ends (Hallway)]. These data still are useful, however, because they provide an overall picture of which graphics are effective at attracting and holding visitor attention.

Figures 3.1 and 3.2 show the percentages of time visitors spent at each graphic in the Entranceway and Hallway. Each figure lists the graphics in chronological order as one would see them as they enter that particular observation area. For example, the first graphic seen upon entering the Entranceway is the “Macaws: Bright and Boisterous” panel, and the last panel seen is “Sharks and Fishes”; and the first panel seen upon leaving the Theater and entering the Hallway is “Dorsal fins give stability” and the last is “A shark’s skin is protected . . .”

As Figure 3.1 reveals, visitors tended to disregard most of the graphics in the Entranceway. The least looked at or read graphics were “From Mystery to Fascination,” which is located across from live (and lively) macaws near the park entrance to the exhibit, and “Sharks and Fishes,” which is located on the left side of the actual entrance to the inside of the exhibit (Lagoon/Tide Pool Room). The panels visitors read or glanced at most were “When you think of a shark . . .” (5% and 31%, respectively) and “Sharks don’t eat people . . . often” (11% and 36%, respectively). Several factors may explain these data. First, the graphics in this area are in stiff competition with the loud macaws. When visitors are looking at the birds, their backs are generally toward the first panel (“From Mystery to Fascination”), and they may miss seeing it altogether. Furthermore, this is the most text-laden panel in the area. Second, after looking at the macaws when first entering, visitors tend to walk quickly through the area, anxious to enter the exhibit itself, thereby missing most of the graphics. Finally, the entrance to the exhibit itself is flanked by two panels, on the right by “Sharks don’t eat people . . . often” and on the left by “Sharks and Fishes.” As Figure 3.1 shows, the former panel is much more popular than the latter. This may be because visitors must turn right in order to enter the exhibit, so the panel on the right side is more plainly in view, whereas the panel on the left requires greater effort to read. In addition, the panel on the left is partially hidden by shrubbery.

As Figure 3.2 reveals, the graphics in the Hallway were more popular than in the Entranceway. The Hallway is on a slight decline, and visitors can hear the “heartbeat” audio played at the entrance to the tube. These factors might serve to hurry visitors along toward the tube. Surprisingly, however, the most popular panels were the two located at the end of the hallway before the entrance to the underwater tube (“Tiny pores lead to . . .” and “. . . shark’s skin is protected . . .”), with 71% and 60% of the visitors either reading or glancing at them, respectively. It is important to note that it is possible to read most, if not all, of these panels in less than 2 seconds. Therefore, these data could mean that the majority of the visitors were able to absorb the information presented as they walked by.

Lagoon/Tide pool Room, Theater, and Exit Room. In the Lagoon/Tide Pool Room, the highest percentage of visitors were attracted to the aquarium closest to the entrance of the exhibit (97.6%). The tide pool and aquarium located across from it were also popular, but visitors spent significantly less time at these (49.78 sec and 47.63 sec, respectively) than at the first aquarium they encounter (71.39 sec). Very few visitors asked the narrator near the tide pool questions (1.8%); yet, not surprisingly, those who did ask questions spent the longest mean time there (205 sec) than at the other elements in the area. Visitors may not be aware of why the narrator is there, especially when the area is crowded and the narrator must act as a disciplinarian to keep children from climbing on the rocks around the tide pool or keep visitors from putting their hands in the pool.

The majority of the graphics in the Lagoon/Tide Pool Room had a low attracting power but a high holding power. The graphic that had a relatively high attracting power (29%) and had the highest holding power contained identification graphics of the fish located in the tank to the right of it (189.86 sec).

Of the elements in the Theater, the aquarium panels directly inside the room and those next to the exit were slightly more popular than the middle panel (82.3% and 79.8%, respectively, vs. 72.7%) and held visitors' attention the longest. These data also show that visitors preferred to watch the video sitting down (23.2%), rather than standing in front of the monitor (5%). Those who do watch the video stay at this element longer than at the other elements in this area. The narrator in this room gives a 3-minute talk about the various fish in the tanks between video shows and encourages visitors to ask questions. Thus, it is not surprising that visitors in this area were more likely to spend time listening to or interacting with the narrator than visitors in the Lagoon/Tide Pool Room (where the narrator does not have a proactive role).

Although the aquarium in the Exit Room attracted fewer visitors than the those found in the Lagoon/Tide Pool Room and Theater, visitors who do spend time there generally stay longer. The large shark jaws attracted the highest percentage of visitors. Those visitors who spend time in the jaws area also spent the longest time reading the graphic panels in front (345.21 sec) and to the left (234.71 sec) of the jaws. Overall, the graphic panels in this area were more successful at holding visitors' attention than those in the Lagoon/Tide Pool Room. Only 3% of the visitors observed took a pamphlet; none were observed reading it while in the area.

Overall, visitors spent the most time in Lagoon/Tide Pool Room (overall mean time = 269.66 sec) and the least time in Exit Room (overall mean time = 100.57 sec). The percentage of visitors and the mean time spent walking or resting positively correlates to the size of the observation area. Thus, the largest area, the Lagoon/Tide Pool Room, had the highest percentage of visitors

observed walking or resting (98.8%) and the highest mean time (82.41 sec); and the smallest area, the Exit Room, had the lowest (64.2% and 24.66 sec, respectively). This may be because more walking is required in the Lagoon/Tide Pool Room to get from one element to the next. Visitors also may be more likely to walk through the Exit Room without looking at any of the elements because they are tired and they can see the exit to the exhibit as they enter this room.

As was expected, visitor groups containing children spent more time in the exhibit than those without children, with the exception of the Exit Room. Again, fatigue and object satiation may have played a role. Visitor groups without children spent the least amount of time in the exhibit. Finally, visitors on average spent slightly more time in the exhibit on the weekends (203.88 sec) than on the weekdays (192.78 sec).

What do visitors learn from the Shark Encounter exhibit?

Cognitive. During the interviews, visitors were asked several questions designed to assess cognitive learning that might have occurred by reading the graphic panels within the exhibit. Each question pertained to a fact presented on one of the graphic panels. These questions were true/false, multiple choice, and open-ended. Although findings show that, in general, visitors were quite knowledgeable about sharks, it is impossible to know how much of this knowledge can be attributed to the exhibit since they were not pre-tested before entering the exhibit.

General questions that addressed common themes found throughout the exhibit, were answered correctly by a large percent of the respondents (98% and 96%, respectively). A question derived from a graphic panel in the Hallway also had a high correct response rate (88%), indicating that although visitors move quickly through the area, they are looking at and reading the graphics there.

Visitors were asked to name or describe all the species they saw in the exhibit. As a whole, visitors were able to name or describe 37 species of shark, fish, and coral. (Descriptive responses were only coded as a particular category if it was apparent beyond a reasonable doubt to the data collector what the respondent meant.) A few visitors (7%) stated that they saw a great white shark despite the fact that there were none in the tank on those days. Only 3% surveyed could not answer this question.

When asked what sharks prey on, 47% of visitors listed "smaller fish/other fish" as one of their answers. Only two visitors could not answer this question. Less than half of visitors were able to say how many teeth sharks lose in a lifetime; only 31% got the correct answer. This question was taken from a graphic that was found to attract only 39.7% of the visitors. Visitors who had

been to the exhibit before did not perform any better than those who were visiting for the first time.

The last item that tested cognitive learning asked visitors to list some reasons sharks are in danger of extinction. This item was designed to determine if the exhibit is effective in projecting conservation as a main theme. The answers that were provided most frequently included over-fishing ($n = 109$), pollution ($n = 65$), gill netting ($n = 43$), and people/ignorance ($n = 39$)—all of which were correct responses.

Affective. Six items on the questionnaire addressed visitors' feelings about the exhibit and attitudes toward issues portrayed in the exhibit. Visitors were asked what in particular they liked and disliked about the exhibit. Almost three-quarters of respondents (71%) listed the underwater tube when asked what they liked about the exhibit, and in most cases, this was the only answer they gave. Asking what visitors disliked generated a greater variety of responses, although the incidence in each response category was small. Almost half the visitors (46%) responded "nothing." Some visitors said the exhibit was too crowded (13%), and 10% said that they could not see the sharks or that there were not enough sharks.

When asked to rate the importance of signs in this exhibit on a scale of 1 to 5, where "1" equals "very important," and "5" equals "unimportant," 42% of the visitors rated them as "very important," 42% as "important," and 16% as "moderately important." No one rated signs as "of little importance" or "unimportant," revealing that all visitors were interested in more than just wanting to view the fish; they were interested in seeing information presented as well.

Using the same Likert scale described above, the majority of the visitors (62%) interviewed rated the importance of understanding the interaction between nature and its inhabitants as "very important," 30% rated it as "important," and 8% rated it as "moderately important." No one rated the interaction between nature and its inhabitants as "of little importance" or "unimportant." When asked if experiencing this exhibit made them more interested in conserving these species, less interested, had no effect, or if they were already concerned, 44% said that they were already concerned, 35% said that the exhibit made them more interested in conservation, 20% said that the exhibit had no effect, and 1% said that the exhibit made them less interested in conservation. To determine whether repeated visits to the exhibit have an effect on how visitors respond to these two questions, first-time visitors to the exhibit were compared to those who had been to the exhibit before. Visitors who had visited the exhibit before were more likely to respond "very important" when asked to rate their understanding of the interaction between nature and its inhabitants than those who were there for the

first time (76% vs. 57%). However, first-time visitors were more likely to state that the exhibit had no effect in changing their attitudes toward conserving these species (22% vs. 12%), or that they were already concerned before coming to the exhibit (46% vs. 40%).

When asked to rate how satisfied they were overall with this exhibit on a scale of 1 to 5, where "1" equals "very satisfied," and 5 equals "very dissatisfied," 34% of the visitors said they were "very satisfied," 58% said they were "satisfied," 7% said they were "somewhat satisfied," and 1% said that they were "dissatisfied."

Visitor Questions and Suggestions for Improvement

Near the end of the interview, we asked visitors if they had questions that were not answered by the exhibit and if they had suggestions for improvement. More than half the visitors said that they did not have any questions. However, 25% asked the data collector what the names of specific sharks/fish/coral were that they saw in the exhibit, and 25% had questions about general shark information (e.g., life span, what they prey on, which are local, etc.) or specific information of the exhibit itself, such as "Why don't the big sharks eat the little ones?" "Why aren't bigger sharks on display?" and "Are they [the sharks and fish on exhibit] happy?"

The questions visitors raised were reflected in their suggestions for improving the exhibit. Of those surveyed, 50% suggested Sea World provide more educational information and graphics on sharks, including displaying maps of shark habitats. Others thought that the existing graphics should be made more visible and easier to find (e.g., raised to eye level). A few visitors (15%) wanted to see a bigger variety of sharks, including exotic species of sharks like the great white and other large sharks. As has been found in other studies (e.g., Serrell, 1977), visitors were also interested in having more hands-on displays, such as a shark's skin to touch, and life-sized shark models.

Conclusion

Overall, the data in this report indicate that the Shark Encounter exhibit is successful in that it both entertains and it educates (Screven, 1986). Additionally, it fulfills Serrell's criterion of a successful exhibit, which is one in which 51% of the visitors attend to 51% of the elements (personal notes, Visitor Studies Association Annual Conference, 1994). However, how does this exhibition compare to standards found in the literature?

Graphics

- From a design perspective (i.e., number of words, content, reading ease) the graphic panels in this exhibit are well designed. However, factors such as visual competition, lighting, and placement have a major influence on those visitors who will stop at an element (Patterson & Bitgood, 1987). The panels in the Entranceway compete with the macaws for visitor attention, and, to a lesser degree, the panel near the tide pool competes with the tide pool. Several panels in the exhibit are difficult to read because they are either poorly lit or too close to the ground. Moving graphics away from the macaws, increasing the lighting, and raising some of the graphics should increase their attracting and holding power.

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Figure 3.1: Percentage of visitors who read or glanced at the Entranceway graphic panels.

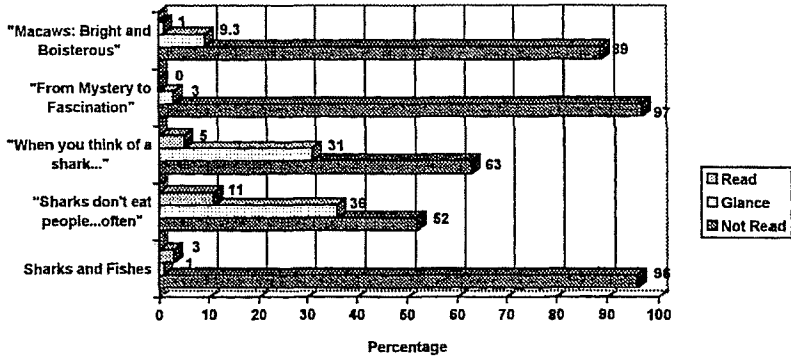


Figure 3.2: Percentage of visitors who read or glanced at the Hallway graphic panels.

