

California Academy of Sciences *Animal Attraction* Summative Evaluation



Prepared by: Jon Deuel, Independent Visitor Studies Consultant and
Jessica Brainard, California Academy of Sciences

Contents

Executive Summary..... 2

Unobtrusive Timing and Tracking Observations..... 5

Focused Observations and Structured Interviews..... 11

Appendices A–C..... 25

Tables and Figures

Unobtrusive Timing and Tracking Observations

Table 1: Visitor stay time (min:sec) in *Animal Attraction*..... 5

Table 2: Rate visitors moved through *Animal Attraction* with Academy exhibitions..... 6

Figure 1: Sweep Rate Index of *Animal Attraction* with Academy exhibitions..... 7

Table 3: Rate visitors moved through *Animal Attraction* with MBA exhibitions..... 8

Figure 2: Sweep Rate Index of *Animal Attraction* with MBA exhibitions..... 8

Table 4: Summary of visitors’ iPad use in *Animal Attraction*..... 9

Figure 3: Frequency distribution of the number of iPads used..... 10

Figure 4: Frequency distribution of exhibition time spent using iPads..... 10

Focused Observations and Structured Interviews

Figure 5: Number of visitors who accessed the iPad sections..... 13

Table 5: Reasons visitors did not access a particular section of the iPad content..... 13

Table 6: Reasons visitors gave for the iPads being confusing or hard to use..... 14

Figure 6: Most interesting iPad content format for visitors..... 15

Table 7: Visitors’ reasons for choosing iPad content as most interesting..... 16

Figure 7: Effect of iPads on visitors’ experience of the live animal displays..... 17

Table 8: Visitors’ reasons for how the iPads affected the live animal displays..... 17

Table 9: What visitors thought *Animal Attraction* is about..... 18

Figure 8: Level of visitors’ main message comprehension in *Animal Attraction*..... 19

Figure 9: Visitors’ overall reaction to *Animal Attraction*’s content and/or terms..... 20

Table 10: Visitors’ thoughts about the appropriateness of content and/or terms..... 21

Table 11: Visitors’ reactions to the exhibition look and feel..... 23

Figure 10: Affective adjectives used by visitors when responding to look and feel..... 24

Table 12: Visitor demographics of the *Animal Attraction* evaluation sample..... 25

Executive Summary

Animal Attraction, a 1,100 square-foot exhibition in the Steinhart Aquarium at the California Academy of Sciences, opened in February 2012. A reinstallation of the former Staff Picks area, the exhibition features diverse stories of animal courtship, mating and reproduction with 18 live animal displays and digital media utilizing an Apple iPad interface.

In July 2012, researchers conducted an evaluation of *Animal Attraction* and the iPad interface. This study was conducted in two parts to unobtrusively examine visitors' behaviors, including their use of the iPads. Researchers also interviewed visitors to discuss their responses to the exhibition, including their understanding of key exhibition messages and their reactions and responses to exhibition and iPad content, design and layout.

Research Questions

1. *How much time do visitors spend in the exhibition?*
2. *What proportion of visitors use the iPads, how many iPads do visitors use, and how much time do visitors spend using the iPads?*
3. *Do visitors understand how to interact with the iPads, and are visitors able to easily navigate and understand the iPad design layout?*
4. *Which type of iPad content do visitors find most interesting? Why?*
5. *What effect do the iPads have on visitors' experience of the live animal displays?*
6. *To what extent do visitors grasp the exhibition's key concepts after interacting with the iPads and exhibit graphics? Are they able to articulate the main message?*
7. *Do visitors feel that the exhibition content is inappropriate or off-putting in any way?*
8. *How do visitors respond to the exhibition's look and feel (i.e. graphic panels, wall treatment) compared to other parts of the Aquarium?*

Methodology

Researchers used both quantitative and qualitative methods to evaluate *Animal Attraction* and iPad use by visitors to the exhibition, including:

Method	Sample size	Description
Timing and tracking observations	162 visitors	Unobtrusive observations of iPad use and time spent in the exhibition
Focused observations with structured interviews	55 visitors	Select visitor behavior observed with open-ended and forced choice questions

Main Findings and Recommendations

Unobtrusive Timing and Tracking Observations

The iPads appeal to all visitor segments we studied.

The vast majority (79%) of visitors used an iPad during their visit to *Animal Attraction* and spent about 20% of their time in the exhibition using the device. Visitors used an average of three iPads, spending an average of 39 seconds using a particular iPad. Moreover, visitors—regardless of their age, gender and group composition—share similar rates of iPad use, time spent using iPads, and proportion of exhibition time spent using iPads.

Visitors who use an iPad stay longer in the exhibition.

Visitors spent an average of two and one-half minutes in *Animal Attraction*, but visitors who used an iPad were more likely to stay longer (over three minutes).

Visitors move through *Animal Attraction* at similar rates to previous Academy exhibitions.

When compared to past Academy exhibitions, the Sweep Rate Index (a measure of the square-feet-per-minute rate visitors cover while in an exhibition) for *Animal Attraction* was 423. This rate was similar to several Academy exhibitions.

***Recommendation:** Consider allocating resources to conduct additional timing and tracking observation studies at the Academy to establish a baseline for comparison and to better understand how visitors are allocating their time.*

Focused Observations and Interviews

While visitors understand how to use the iPads, some key content is overlooked.

While most visitors said that they did not experience any problems using the iPads, one-half did not access some specific sections of the screen layout featuring key content. The least accessed content, Behind the Scenes and Next Animal, are both located on the right side of the iPad screen layout and were simply not noticed by many visitors.

***Recommendation:** Consider revising the iPad layout to help visitors more easily navigate and find content, especially the content currently accessed through the right navigation bar. In addition, when developing future media components, consider conducting formative evaluation to glean insights regarding potential layout and navigation challenges.*

The iPads enhance how visitors experience the live animal displays.

Nearly all visitors said that using an iPad in *Animal Attraction* enhanced how they experienced the live animal displays in the exhibition. Many visitors said that, with the iPads, they learned new or more information about the animals in the displays. Many visitors also cited seeing more of the animals' behaviors and details. Some visitors said that they used the iPads to help them identify and locate the live animals in the displays.

Visitors have a proper, albeit, limited understanding of the exhibition's key concepts.

When visitors were asked to describe what the exhibition is about, the majority of visitors interviewed mentioned a concept connected to the exhibition's key messages. However, only a few offered a more detailed response such as "unique behaviors all related to mating and courtship." Most visitors responded with only little or some detail, citing single key words (e.g., "reproduction," "mating," "attraction," "sex") or responses with only a general connection between the key words and animal behaviors, including "the process of attraction" or "what happens during mating."

***Recommendation:** Consider reinforcing the main message throughout the exhibition, including within the species-specific content presented in each of the 18 iPads.*

***Animal Attraction* successfully walks the line between the exhibition's subject matter and what some visitors expect to see at the Academy.**

While most visitors said that the content and terms used in *Animal Attraction* are appropriate, one-fifth of interviewees commented that the exhibition content is inappropriate for younger visitors.

***Recommendation:** Consider conducting front-end and formative evaluation as part of the exhibit development process to better understand how the proposed exhibit content, concepts and terminology meet visitors' expectations of what they will experience in an Academy exhibition.*

Visitors have a positive affective response to the look and feel of *Animal Attraction*.

Most visitors offered a positive emotional reaction to the exhibition design compared to the rest of the Steinhart Aquarium, particularly the warm and attractive colors described as "bright" and "inviting." However, a few visitors assumed that, because of its bright colors, the exhibition is targeted to a younger audience.

Unobtrusive Timing and Tracking Observations

Tracking and timing observations provide an objective account of visitor behaviors and use of exhibition components. With these unobtrusive observations, an individual visitor is followed through an exhibition while the data collector records when the targeted visitor stops at an exhibition component and for how long. These data indicate the attracting and holding time of the exhibit components within the whole exhibition.

Methodology

A total of 163 visitors were unobtrusively observed during their visit to *Animal Attraction* from July 19 to 22, 2012. An adult, visiting with other adults and/or children, was randomly selected for observation as they entered the exhibition, equally from each entrance portal. In addition to tracking which iPad(s) visitors used—there were a total of 18 live animal displays with 18 corresponding iPads—researchers noted the visitors’ gender, estimated their age and noted if they were visiting with children. Since the iPad displays are relatively small, researchers defined iPad use to include only visitors who stopped with feet planted at an iPad for a minimum of two seconds *and* had, at most, one person in between themselves and the iPad.

1. How much time do visitors spend in *Animal Attraction*?

On average, visitors spent about two and one-half minutes (2:36) in *Animal Attraction* with a range of 15 seconds to eight minutes and 35 seconds. However, visitors who used an iPad in *Animal Attraction* were more likely to stay longer (3:05) compared to those who did not use an iPad (0:46) (Table 1).

Table 1: Visitor stay time (min:sec) in *Animal Attraction*¹

Metric	Mean	Median	Lowest	Highest	Standard deviation
Time spent in exhibition: all visitors	2:36	2:18	0:15	8:35	1:58
Time spent in exhibition: iPad users	3:05	2:40	0:26	8:35	1:55
Time spent in exhibition: did not use iPad	0:46	0:36	0:15	2:50	0:36

¹ There were no statistically significant differences in stay time based on group composition, gender or estimated age.

While average stay times at exhibitions can be challenging to compare for many reasons, including exhibition size and style, visitor researcher Beverly Serrell developed the Sweep Rate Index (SRI) measure to contextualize various exhibition stay times. She also compiled stay time data from several previous Academy exhibitions.²

The SRI is a measure of the square-feet-per-minute rate visitors cover while in an exhibition—the lower the square footage per minute (or the lower sweep rate), the slower visitors are moving through, and staying longer in, an exhibition.

The SRI for *Animal Attraction* is 423, which is similar to many previous Academy exhibitions (Table 2 & Figure 1). The SRI for *Animal Attraction* is also similar to several recent exhibitions at the Monterey Bay Aquarium (Table 3 & Figure 2).

Table 2: Rate visitors moved through *Animal Attraction* and previous Academy exhibitions: square footage per minute/Sweep Rate Index (SRI)

Exhibition	Square feet	Mean stay time	Sweep Rate Index
New Academy exhibitions			
<i>Animal Attraction</i>	1,100	2.6	423
<i>Altered State: Climate Change in California</i>	6,000	5.28	1,136
Old Academy exhibitions			
<i>Hands-on Science</i>	2,300	9.0	256
<i>Life through Time</i>	4,000	15.0	267
<i>Monarcha</i>	6,500	23.0	283
<i>Amber: Window to the Past</i>	6,797	21.0	324
<i>Jurassic!</i>	1,950	5.0	390
<i>Birds of a Feather</i>	2,100	4.0	525
<i>Wild California</i>	9,175	8.0	1,147
<i>African Hall</i>	9,475	5.0	1,895

² More information about Sweep Rate Index can be found in Serrell, B. (1998). *Paying Attention: Visitors and Museum Exhibits*. Washington, DC: American Association of Museums.

Figure 1: Sweep Rate Index of *Animal Attraction* compared to previous Academy exhibitions

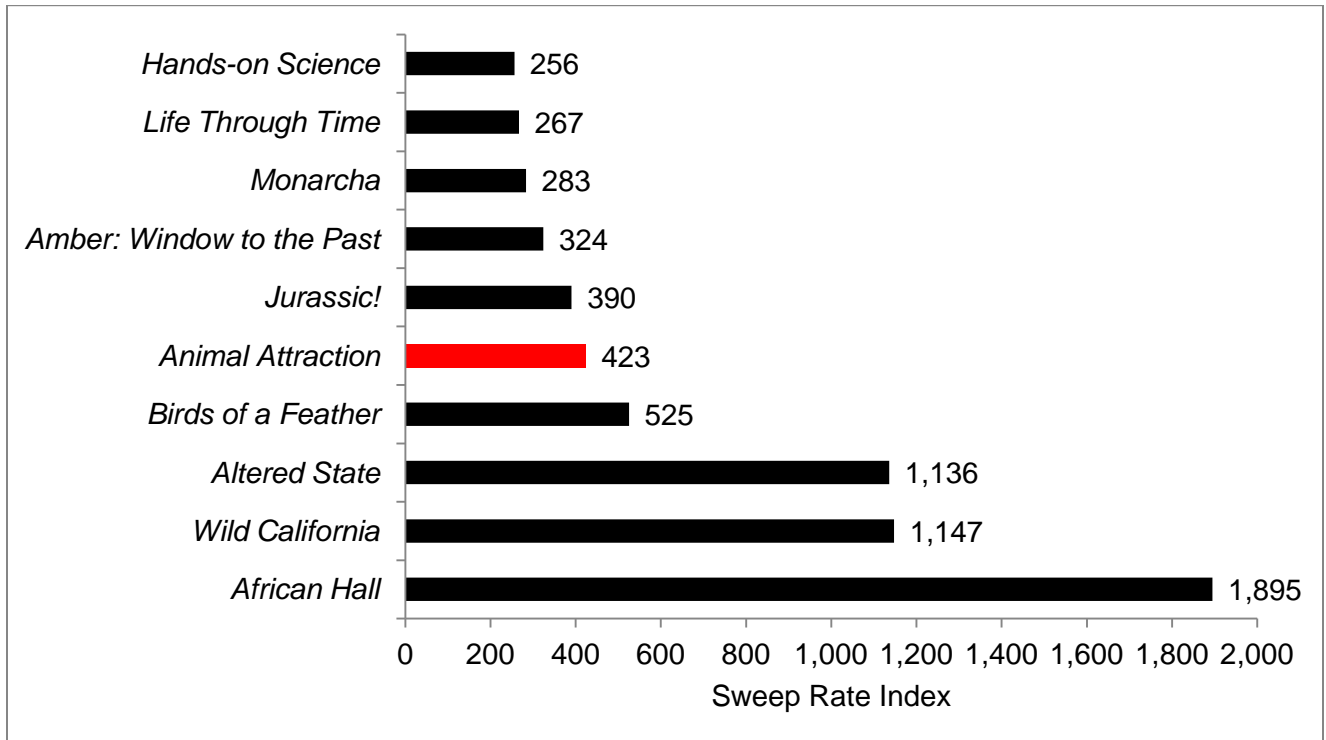
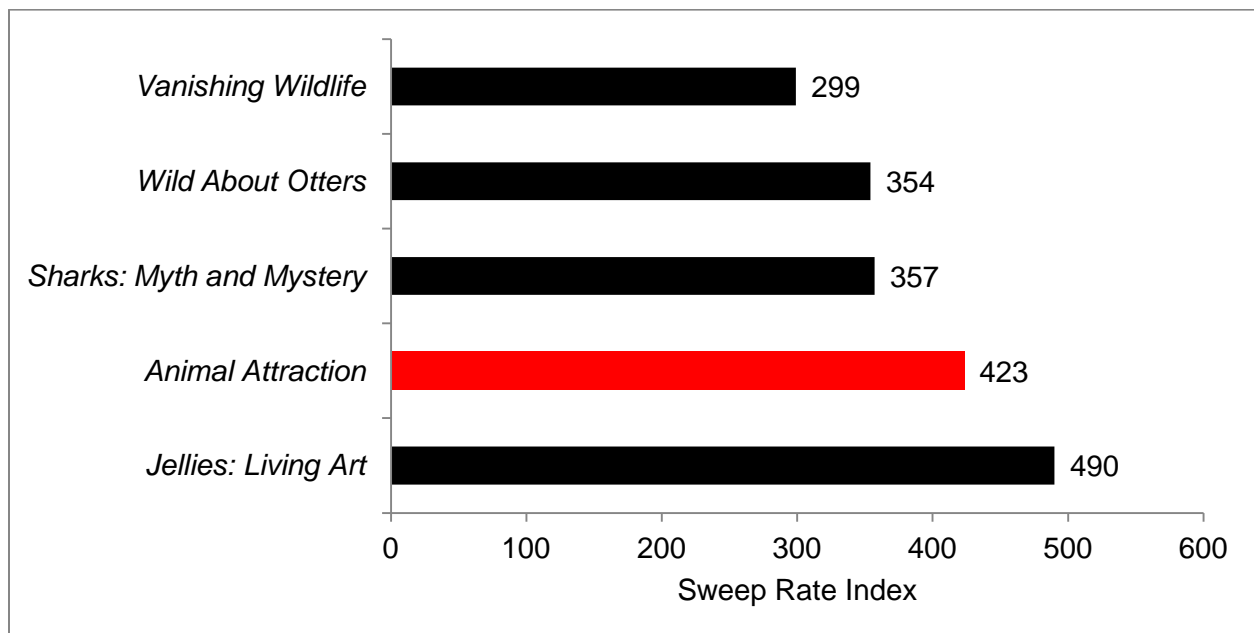


Table 3: Rate visitors moved through *Animal Attraction* compared to recent exhibitions at the Monterey Bay Aquarium: square footage per minute/Sweep Rate Index (SRI)

Exhibition	Square feet	Mean stay time	Sweep Rate Index
<i>Animal Attraction</i>	1,100	2.6	423
<i>Vanishing Wildlife</i> (2001)	1,702	5.7	299
<i>Wild About Otters</i> (2007)	4,600	13.0	354
<i>Sharks: Myth and Mystery</i> (2004)	4,609	12.9	357
<i>Jellies: Living Art</i> (2002)	4,650	9.5	490

Figure 2: Sweep Rate Index of *Animal Attraction* compared to recent exhibitions at the Monterey Bay Aquarium



2. What proportion of visitors use the iPads, how many iPads do visitors use and how much time do visitors spend using the iPads?

The vast majority of visitors (79%) used an iPad during their visit to *Animal Attraction*. These visitors used an average of three iPads (Table 2), with two-thirds (68%) using the touchscreen to navigate and one-third (32%) watching other visitors navigate. In addition, about one-third of observed visitors (37%) watched at least one video on the iPad.

Visitors who used an iPad spent an average of 39 seconds doing so. However, there was a relatively wide distribution of times ($s=0:43$) in a range between two seconds and three minutes, 57 seconds. Moreover, on average, visitors spent about one-fifth (18%) of their total time in the exhibition using an iPad(s) (Table 2).

To determine whether demographics influenced the number of iPads used and/or the proportion of exhibition time spent using the iPads, researchers identified a group of visitors that were heavy iPads users. Twenty-seven percent of visitors were considered heavy users—with 22% using either more than five iPads or using the iPads for more than 30% of their exhibition time and 5% doing both (Figures 1 and 2).

However, when comparing iPad use among the various visitor segments (e.g., men and women, adult-only groups and groups with children), those of various ages and heavy and non-heavy users, there were no significant differences in iPad use, time spent and the proportion of exhibition time spent using an iPad.

Table 4: Summary of visitors' iPad use in *Animal Attraction*³

Metric	Mean	Lowest	Highest	Standard deviation
Number of iPads used (out of 18)	3	1	13	2.3
Time spent using the iPads	0:39	0:02	3:57	0:43
Proportion of exhibition time spent using iPad(s)	18%	1%	63%	14%

³ Summary statistics are only from visitors who used an iPad. There were no statistically significant differences in each metric based on group composition, gender or estimated age.

Figure 3: Frequency distribution of the number of iPads used

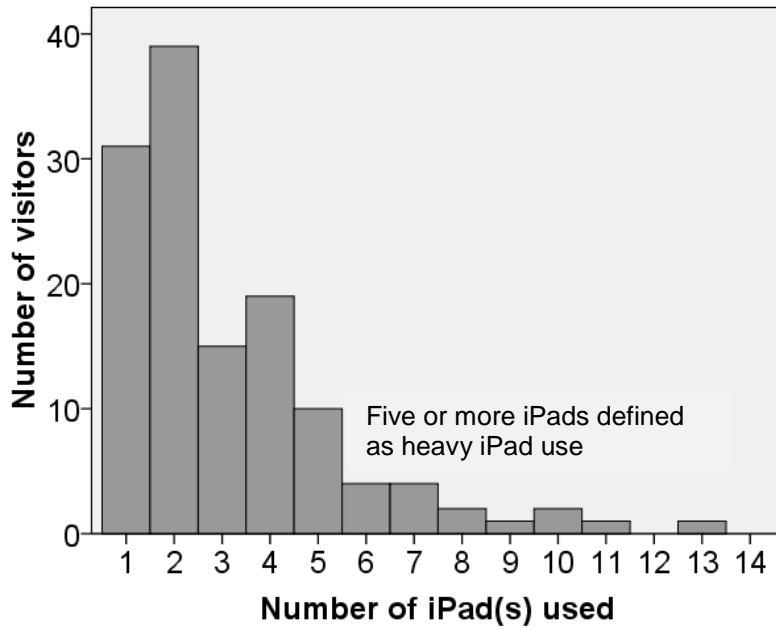
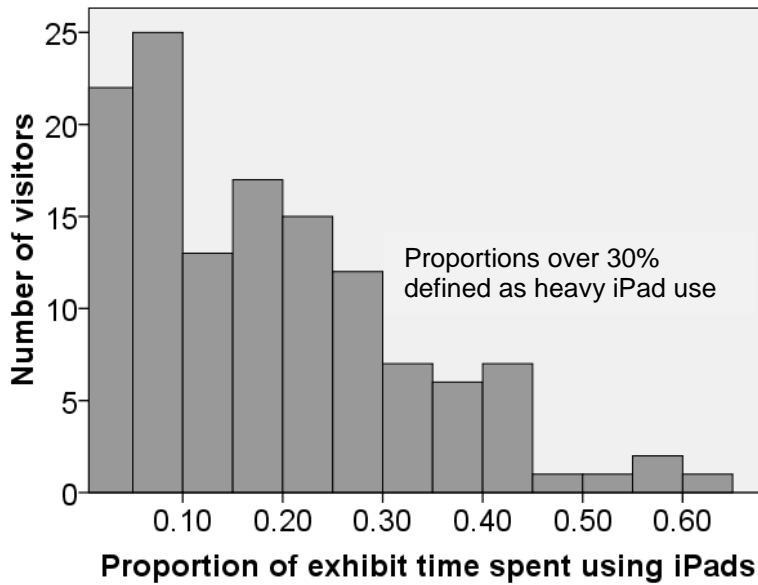


Figure 4: Frequency distribution of the proportion of exhibition time spent using iPads



Focused Observations and Interviews

Focused observations and interviews provide detailed information about visitors' experiences at select exhibit components. The observations provide a behavioral account of how visitors used the exhibition and its components. The interviews enable visitors to explain their behaviors and describe what they thought the exhibit was about and how it might be changed to make it more inviting, accessible or understandable. Through such discussions, we are able to detect problem areas as well as areas that are successful.

Methodology

On July 12-18, 2012, a total of 55 visitors were invited to interact with a cordoned-off section of *Animal Attraction*, an area just inside the mantid portal on the California Coast side of the gallery. Visitors had access to four live animal displays and associated iPads featuring the banana slug (*Ariolimax californicus*), brown garden snail (*Cornu aspersum*), coral-banded shrimp (*Stenopus* sp.), devil's flower mantid (*Idolomantis diabolica*) and Surinam toad (*Pipa pipa*) species. The iPad accompanying the devil's flower mantid/ Surinam toad display is one of two *Animal Attraction* iPads to feature the "Next Animal" option (i.e., two species).⁴

Select visitor behavior was observed as they and their group explored the exhibition section and used the iPads. Once visitors decided they were finished, researchers conducted a structured interview lasting between five and ten minutes. The structured interviews were designed to understand how visitors use the iPads, the device's relationship to the live animal displays and visitors' grasp of the exhibitions key messages.



©Andrew McCormick/California Academy of Sciences

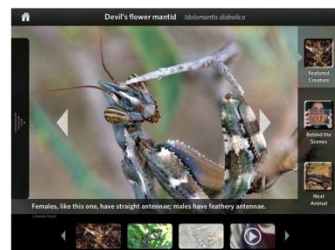
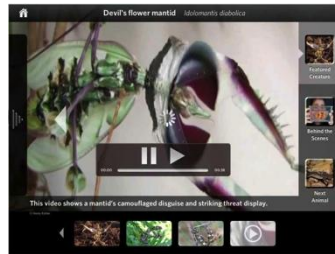
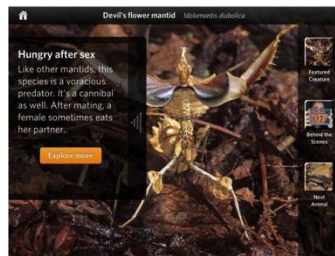
⁴ The orange-spotted filefish (*Oxymonacanthus longirostris*) and stony corals (*Acropora* sp.) live display and iPad also features two species (i.e., "Next Animal"). However, this display was not included in the focused observations and structured interview study area.

3. Do visitors understand how to interact with the iPads and are visitors able to easily navigate and understand the iPad design layout?

About two-thirds (64%) of visitors said that they had used an iPad prior to their *Animal Attraction* visit, 22% had not and 15% said that they had only limited experience with the device.

However, to determine if visitors understood how to interact with the iPads in the exhibition, researchers observed whether or not visitors accessed the iPad content, which was divided into the following five sections:

- **Introductory Screen:** content accessed by tapping the iPad screen’s default “Touch to explore” attract screen
- **Explore More:** content accessed by tapping the “Explore more” button
- **Gallery:** the photo and video options featured on the bottom navigation ribbon of the iPad screen
- **Behind the Scenes:** content accessed by tapping the “Behind the Scenes” button on the right side of the iPad screen
- **Next Animal:** content accessed by tapping the “Next Animal” button on the right side of the mantid/toad iPad screen



While all visitors accessed the Introductory Screen, Explore More and Gallery sections, only about one-half accessed the Behind the Scenes and Next Animal sections (Figure 3).

If visitors did not access a particular section, researchers asked if there were any specific reasons why. Many visitors, particularly those who did not access the sections on the right side of the iPad screen (Behind the Scenes and Next Animal), said that they did not notice these options (Table 3).

Figure 5: Number of visitors who accessed the iPad sections (n=55)

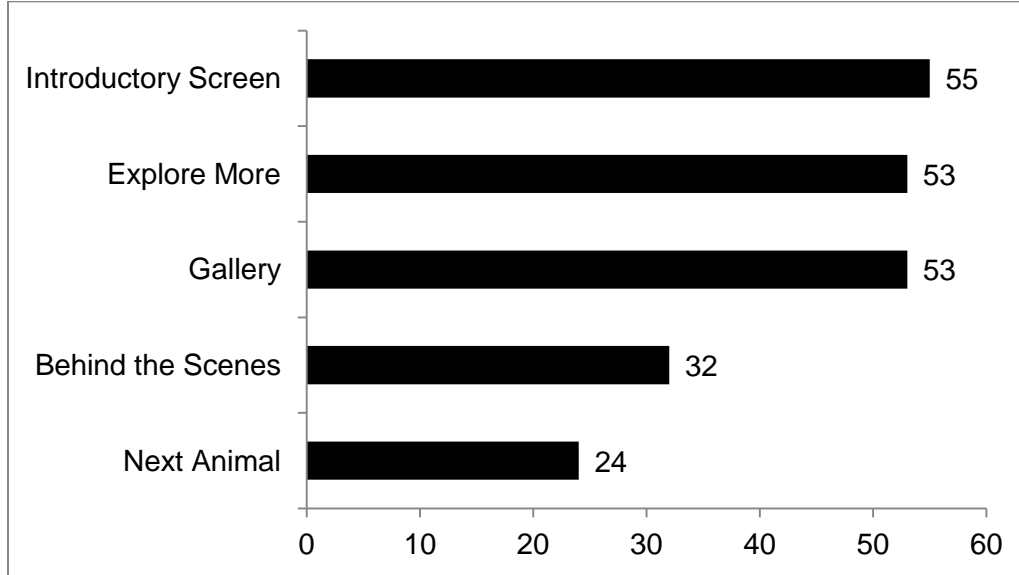


Table 5: Reasons visitors did not access a particular section of the iPad content

Reasons visitors did not access sections of iPad content	Frequency
Did not notice/see section(s) (on the right side of the iPad screen)	18
Finished using iPad	11
Spend less time using iPad/more time looking at animal	8
Other visitor(s) wanted to stop using iPad	3
Focused on other iPad sections	5
Confused by the function of an iPad section	4
Total responses	38

Note: Some visitors gave a multifaceted response that fit more than one category, so the frequency of responses exceeds the number of visitors who responded. Examples of visitor quotes for each category appear in *Appendix C*.

Researchers also asked visitors if anything about the iPads was confusing or hard to use. Most (40 of 55) said that they were not confused by and did not have problems using the iPads.

Of those that reported issues, the most common were interface issues including citing an activation delay after touching the screen and not understanding the function of the “Next Animal” option. A few visitors mentioned that the device was too small for multiple people to use (Table 4).

Table 6: Reasons visitors gave for the iPads being confusing or hard to use

Reasons iPads were confusing or hard to use	Frequency
Interface issues	16
Activation delay after touching	4
Next animal not understood/single animal iPads easier to navigate	4
Bottom of screen not visible/understood	3
Right side of screen not visible/understood	2
General interface issues	1
Thought swipe rather than touch interface	1
Did not notice return to home screen option	1
Device size/location issues	3
Device/text too small for use/viewing by multiple people	2
Device mounted too low	1
Total responses	19

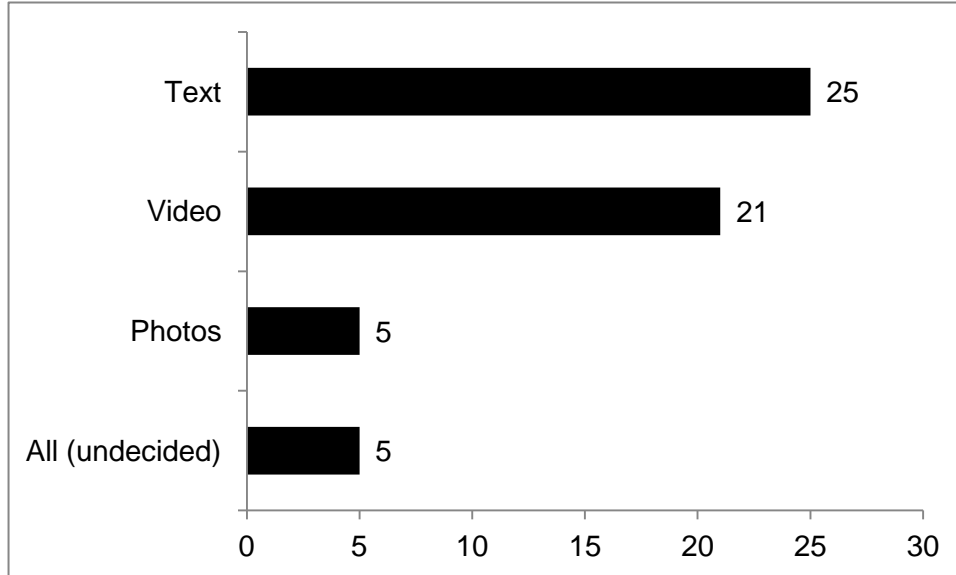
Note: Some visitors gave a multifaceted response that fit more than one category. Therefore, the frequency of responses exceeds the number of visitors who responded. Examples of visitor quotes for each category appear in Appendix C.

While most visitors said that they had no problems using the iPads, one-half did not access some specific iPad sections featuring key content. The least accessed content—Behind the Scenes and Next Animal—are located on the right side of the iPad and were simply not noticed by many visitors. This information, coupled with some visitors reporting confusion with the Next Animal option, may be an indication that visitors will more easily navigate to the iPad content with some minor layout design revision.

4. Which iPad content format do visitors find most interesting? Why?

Many visitors cited the label text as the most interesting aspect of the iPad content, noting that they learned new information from reading the text. In addition, many visitors cited video as most interesting, noting that the video provided an opportunity to view rarely seen animal behavior (e.g., birth and copulation), and otherwise static animals such as snails and slugs in action (Figure 4 and Table 5).

Figure 4: Most interesting iPad content format for visitors (n=56)



Note: Some visitors gave a multifaceted response that fit more than one category. Therefore, the frequency of responses exceeds the number of visitors who responded.

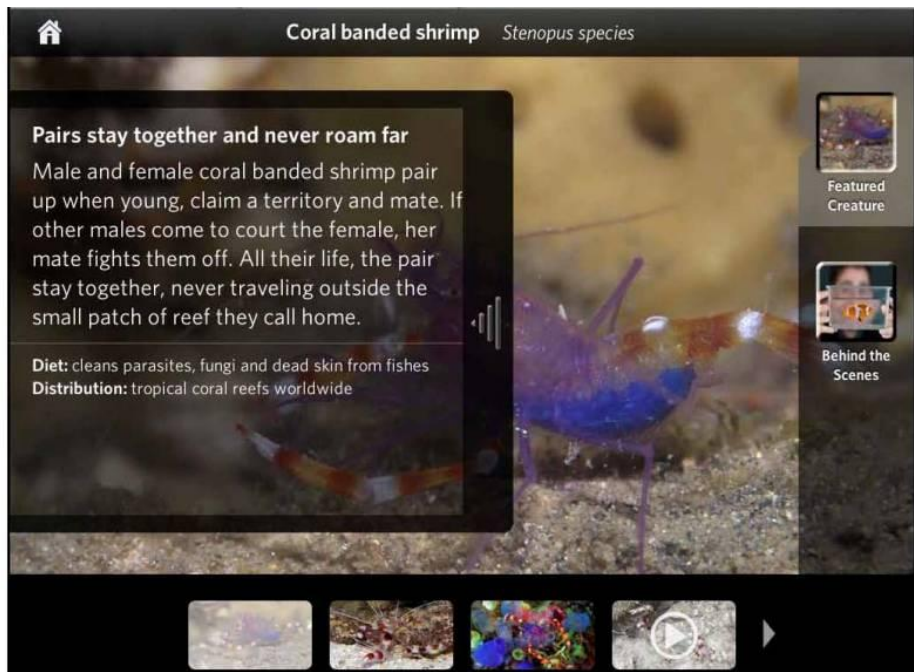
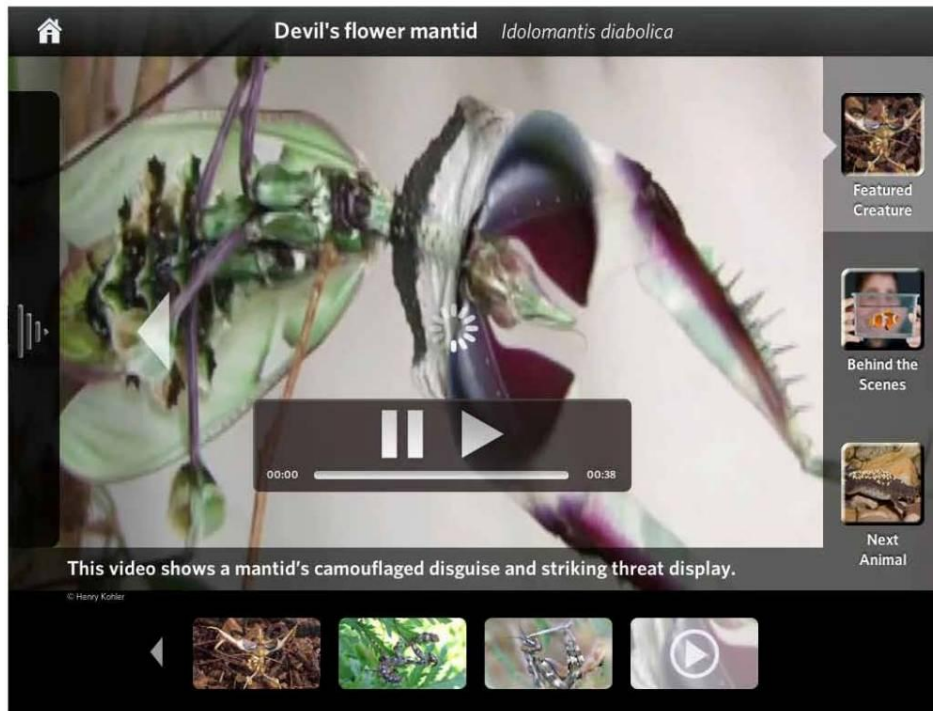


Table 7: Visitors' reasons for choosing specific iPad content format as most interesting

Visitors reasons for choosing iPad content as most interesting	Frequency
Text enhanced exhibit experience	22
Learned new/more information	14
General text enhanced exhibit experience	4
Quick/easy to use	4
Video enhanced exhibit experience	20
See rarely occurring behavior (e.g., birth, sex, mating rituals)	14
See otherwise static animals in action (e.g., snails, slugs)	3
Less to read	2
General video enhanced exhibit experience	1
Photos enhanced exhibit experience	4
Quick/easy to use	2
See animal in different poses	1
Learned new/more information	1
No specific reason	8
Total responses	54

Note: Some visitors cited multiple responses that fit more than one category. Therefore, the frequency of responses exceeds the number of visitors who responded. Examples of visitor quotes for each category appear in Appendix C.



5. What effect do the iPads have on visitors' experience of the live animal displays?

Nearly all visitors said that the iPad enhanced how they experienced the live animal displays (Figure 5) in the exhibition. Many visitors said that, from the iPads, they learned new or more information about the animals in the displays. In addition, many visitors said that the iPad content allowed them to see more of the featured animals' behaviors and details. Some visitors said that they used the iPads to help them identify and locate the live animals in the displays (Table 6).

Figure 7: Effect of iPads on visitors' experience of the live animal displays (n=55)

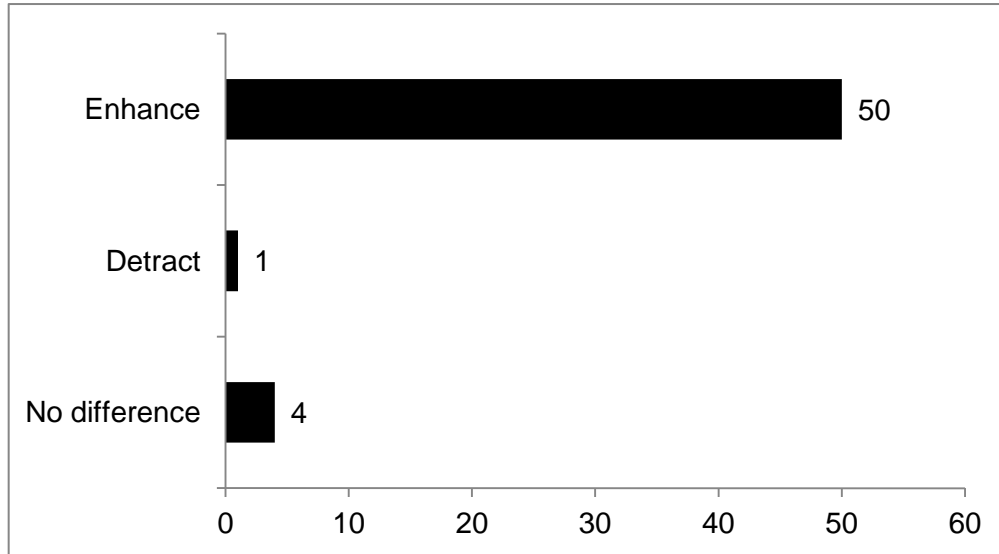


Table 8: Visitors' reasons for how the iPads affected their live animal display experience

Visitors' reasons for how the iPads affected their experience with the live animal displays	Frequency
How the iPads enhanced the live animal display	60
Learned new/more information	23
See more of the animal's behavior/details	21
Helped in animal identification/location	11
Increased interest in/relevance of animal	5
How the iPads detracted from the live animal display	1
Distracted from live animal display	1
How the iPads made no difference	4
Rather look at actual animal in display	2
Only basic information	1
General iPad made no difference	1
Total responses	65

Note: Some visitors cited multiple responses that fit more than one category, so the frequency of responses exceeds the number of visitors who responded. Examples of visitor quotes for each category appear in *Appendix C*.

6. To what extent do visitors’ grasp the exhibition’s key concepts after interacting with the iPads and interpretive graphics? Are they able to articulate the main message?

The main message of *Animal Attraction* (“Animals go to extremes to pass on their genes.”) was supported by several key messages about the purpose and results of sexual selection and reproductive adaptations. When asked what they thought the exhibition section they visited was about, many visitors cited reproduction, mating, attraction and sex, including the reproductive process and animal behavior during reproduction. Some visitors’ responses focused more generally on nature and animals, including habitat and environment (Table 7).

Table 9: What visitors thought *Animal Attraction* was about

What visitors thought <i>Animal Attraction</i> was about	Frequency
Reproduction, mating, attraction, sex	73
Reproduction, mating, attraction, sex in general	35
Behavior/process	34
Birth	3
Beauty	1
Nature/animals	20
Nature/animals in general	8
Habitat/environment	7
Camouflage	2
Snails	2
Forms of life	1
About The Academy	4
Behind the scenes	3
Trying new exhibition techniques	1
I don’t know/not sure	2
Total responses	99

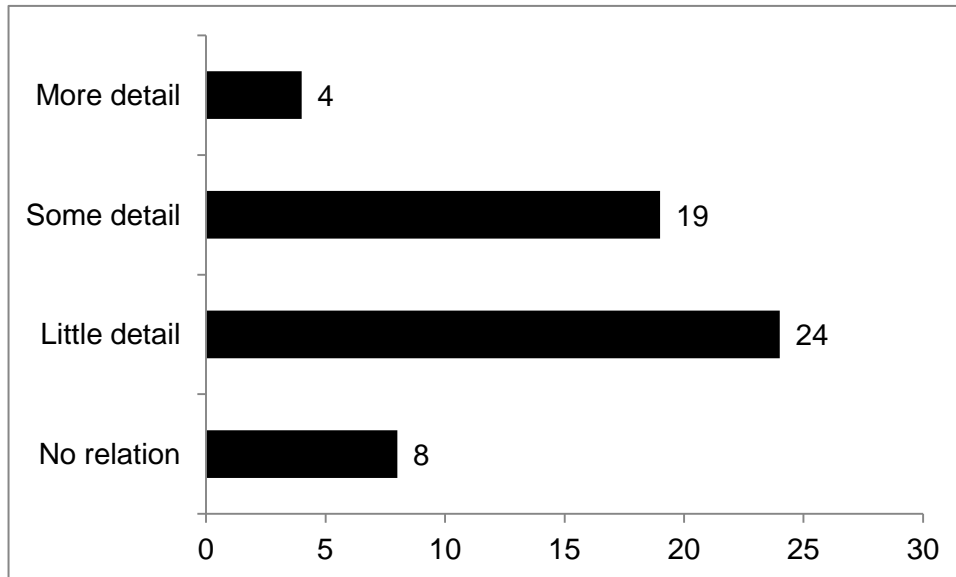
Note: Some visitors cited multiple responses that fit more than one category. Therefore, the frequency of responses exceeds the number of visitors who responded. Examples of visitor quotes for each category appear in Appendix C.

Researchers also analyzed visitors' responses to determine the level of key message comprehension based on the following parameters:

- **Responses with more detail:** Using descriptions and adjectives along with connecting key words with animal behaviors (e.g., unique, unusual, variety of mating behavior).
- **Responses with some detail:** Connecting key words with animal behaviors (e.g., process of attraction, what happens during mating).
- **Responses with little detail:** Using single key word description (e.g., reproduction, mating, attraction, sex).
- **Responses with no relation to main or key messages**

While the majority of visitors, when queried, mentioned a concept connected to the key messages, only a few gave a more detailed response, including “unique behaviors all related to mating and courtship.” In contrast, most visitors offered responses with little detail, including single key words such as “reproduction,” “mating,” “attraction,” “sex” or responses with only a general connection between the key words and animal behaviors (e.g., “the process of attraction” or “what happens during mating”) (Figure 6).

Figure 8: Level of visitors' main message comprehension in *Animal Attraction* (n=55)

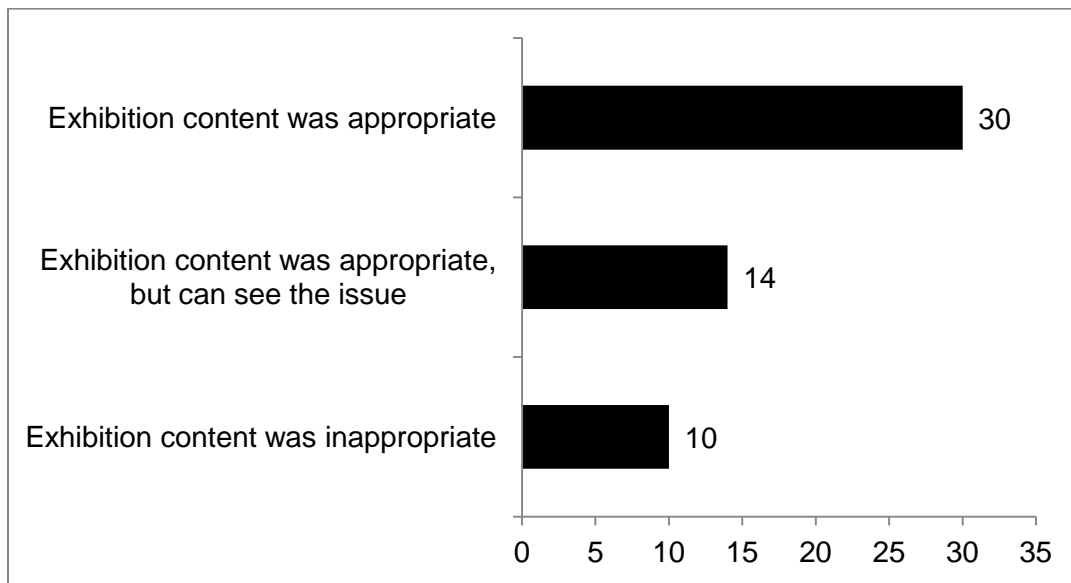


7. Do visitors feel that the exhibition content and/or terms are inappropriate or off-putting in any way?

Most visitors interviewed said that the content and terms used in *Animal Attraction* were appropriate for all audiences, noting that the exhibit text referenced explicit, anatomically correct nomenclature presented with the context of a science institution. However, of these visitors who found the exhibit content appropriate, some mentioned that they understood why others might find some of the terminology used in the exhibition inappropriate for children. Moreover, some visitors said that the exhibition content was inappropriate for younger audiences, mentioning that parents may not be ready to talk to their children about sex (Figure 7 and Table 8).

Visitors come to a museum with expectations of what they will find. These expectations are shaped by their personal context and tend to drive their reaction to content.⁵ While many visitors are not put off by the subject matter of *Animal Attraction*, one-fifth of interviewees deemed the exhibition content inappropriate for young visitors. These findings indicate that *Animal Attraction* successfully walks the fine line between the exhibition’s subject matter and what visitors expect to see at the Academy.

Figure 9: Visitors’ overall reaction to *Animal Attraction*’s content and/or terms (n=54)

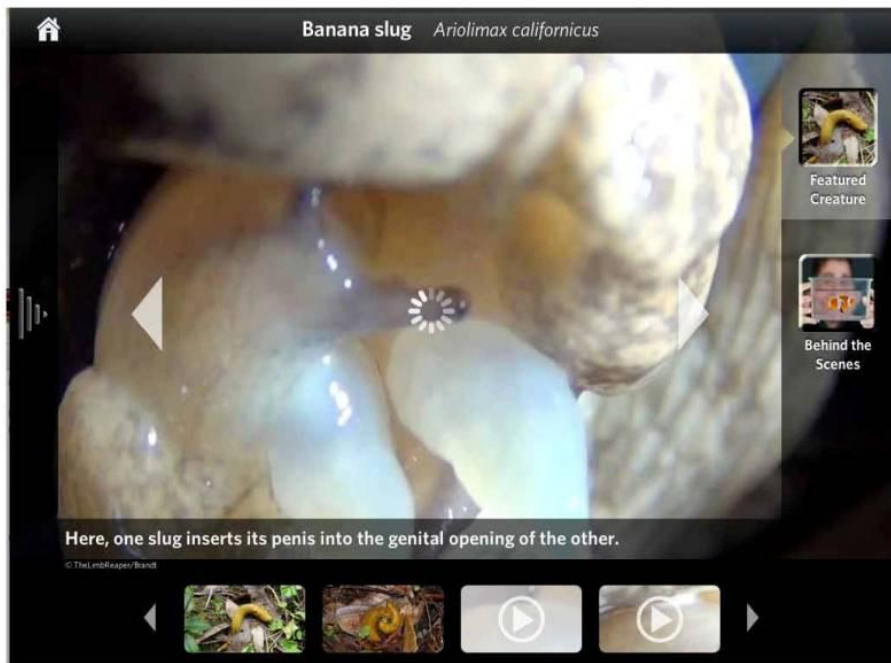


⁵ Falk and Dierking. *The Museum Experience*. Washington, D.C.: Whalesback Books, 1992.

Table 10: Visitors thoughts about the appropriateness of *Animal Attraction*'s content and/or terms

Visitors thoughts about the appropriateness of content and/or terms	Frequency
Appropriate terms	30
Scientific/actual/correct name	17
Scientific terms presented in science institution	5
Terms were appropriate in general	3
A good place to find out about content	2
Kids are old enough/old enough to read	2
People are already exposed to terms	1
Appropriate, but can see the issue	14
May be an issue for those with children	6
May be an issue for young audience	6
Terms were unexpected/surprising	1
Appropriate, but can see the issue in general	1
Inappropriate terms	10
Adults not ready to talk about sex with children	5
Children too young	2
Subject inappropriate for children	2
Substitute terms (e.g., mate versus sex)	1
Total responses	54

Note: Some visitors gave a multifaceted response that fit more than one category. Therefore, the frequency of responses exceeds the number of visitors who responded. Examples of visitor quotes for each category appear in Appendix C.



8. How do visitors respond to the exhibition's look and feel (i.e. graphic panels, wall treatment) compared to other parts of the Steinhart Aquarium?

Exploring visitors' emotions, attitudes and feelings are a valuable step to understanding how to effectively communicate exhibition content.⁶ Social psychology research suggests museum visitors' positive moods lead to increased attention and better receptivity of cognitive concepts, which helps change attitudes during the communication of information.⁷ Also, the emotional nature of learning cognitive concepts determines what visitors repeat, share, reflect on and ultimately remember (or choose not to remember) about their museum experience.⁸

To understand visitors' responses to the look and feel of *Animal Attraction*, researchers asked for their quick reactions to the exhibition appearance compared to other parts of the Steinhart Aquarium. Most visitors offered a positive emotional response to the exhibition, particularly the bright, attractive and inviting colors. A few visitors had a negative reaction, considering the appearance too busy (Table 9).

Interestingly, findings indicate that a few visitors assumed that, because of its bright colors, the exhibition is targeted to a younger audience. This perspective, coupled with the opinion that the exhibition's content is inappropriate for children, may pose a mismatch of expectations for some visitors.



©Andrew McCormick/California Academy of Sciences

⁶ When examining human emotions, feelings, attitudes, values and beliefs, the term *affect* is often used to describe the experience. *Affective learning* describes the process of people engaging with their emotions and values. Although we understand that both cognitive learning (facts and figures, for example) and affective learning occurs in exhibitions, we know much more about the cognitive experience than the affective experience. Visitor studies generally quantify the cognitive information a visitor has gained from an exhibition. However, little research has assessed visitor appreciation of exhibition appearance, design and/or layout. This type of research has proven challenging since emotions, feelings, attitudes and beliefs are intangible, and affective learning is abstract.

⁷ Webb, Robert C. *Changing Attitudes Through Affect*. Paper presented at the Visitor Studies Association Annual Conference, 2004.

⁸ Myers, O. E., et al. *Emotional Dimensions of Watching Zoo Animals*. *Curator* (47/3), 2004.

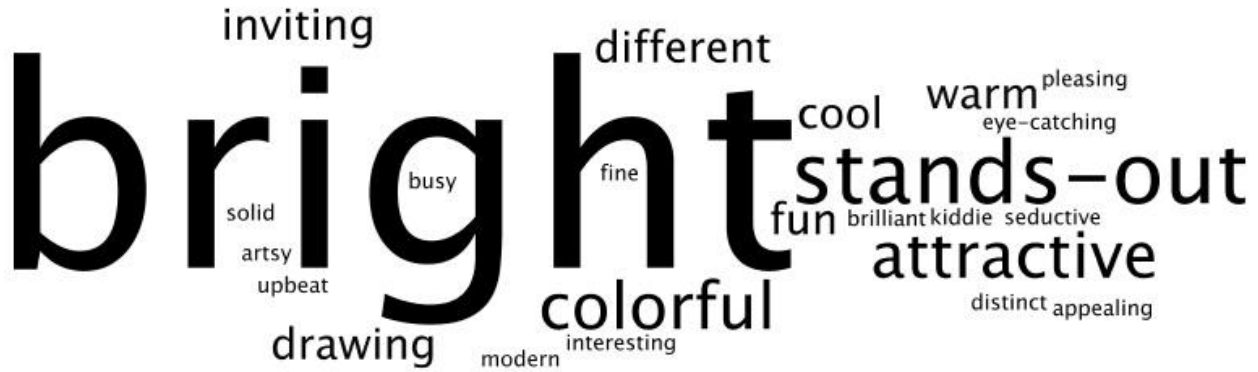
Table 11: Visitors reactions to the exhibition’s look and feel compared to other parts of the Steinhart Aquarium

Visitors reactions to the exhibition’s look and feel	Frequency
Positive reaction	51
Colors are inviting/bright/attractive/interesting/warm	22
Generally bright(er)/inviting	14
iPads are attractive/cool/interactive	7
See more photos	2
The exhibition is more modern	2
General positive reaction	2
More variety of species	1
More information	1
Impartial reaction	9
Looks like exhibit is for kids	3
General impartial reaction	3
Colors are different	2
Didn’t notice surroundings, just live animals	1
Negative reactions	4
Too much/busy	2
Small displays	1
No need for pictures, just live animals	1
Total responses	64

Note: Some visitors gave a multifaceted response that fit more than one category, so the frequency of responses exceeds the number of visitors who responded. Examples of visitor quotes for each category appear in *Appendix C*.

In addition to the content analysis of visitors' reaction to the appearance of *Animal Attraction*, researchers isolated and analyzed the first adjective visitors used in their response. By a large margin, visitors used the word "bright" to describe the exhibition. Other words used by many visitors included "stands-out," "attractive" and colorful" (Figure 8).

Figure 10: Affective adjectives used by visitors when responding to *Animal Attraction's* look and feel⁹



©Andrew McCormick/California Academy of Sciences

⁹ The data in *Figure 8* is displayed as a tag cloud (or word cloud), where the frequency of specific text is represented in relative size—in this case, the more frequently the affective adjective was used by visitors, the larger the word appears in *Figure 8*. This display was created using the Wordle software application.

Appendix A. Visitor Sample Demographics

The entire sample of 218 visitors was evenly split between female and male. However, researchers disproportionately observed groups with children (Table 10).

Table 12: Visitor demographics of the *Animal Attraction* evaluation sample

Unobtrusive timing & tracking observations (n=163)		Focused observations and structured interviews (n=55)	
	Proportion		Proportion
Male	55%	Male	44%
Female	45%	Female	56%
Group with children	66%	Group with children	45%
Adult-only group	34%	Adult-only group	54%
Entered at mantid portal	66%	First visit to the Academy	52%
Entered at filefish portal	33%	Repeat visitor	47%
Estimated age		Age	
18-24	10%	18-24	11%
25-34	40%	25-34	35%
35-44	26%	35-44	16%
45-54	9%	45-54	26%
55-64	10%	55-64	7%
65+	4%	65+	5%

Appendix B. Evaluation Instruments

Unobtrusive timing and tracking observation instrument

California Academy of Sciences: *Animal Attraction* Evaluation: Timing & Tracking Date _____

ID# _____ Group: Adult-only w/kids Gender: M F

Entrance: M portal FF portal # of videos: _____

Approximate Age: 18-24 25-34 35-44 45-54 55-64 65+

Time using iPads: _____ # of iPads viewed: _____ # of iPads touched: _____

Time in exhibit: _____ to _____ = _____

Focused observations and structured interview instrument

California Academy of Sciences: *Animal Attraction* Evaluation Interview ID# _____ Date _____

Observation:

Group: Adult-only w/kids Gender: M F iPad use: intro exp.more gallery bts next

Interview:

We're trying to get an idea of what visitors think about the iPads, so:

1. Have you used an iPad before? Yes No Somewhat
2. What, if anything, about these iPads seemed confusing or hard to use? [prompt: design, layout]

We divided the iPad information into a few sections, including text, animal photos and video, "behind the scenes" and "next" animal.

3. I noticed you didn't use _____ section(s), any particular reason why?
4. Of the parts you used, which was the most interesting? Why?
5. Compared to the live animal displays, would you say the iPad enhanced, detracted or made no difference in what you thought about live animal displays? E D ND [How so?]
6. What would you say this exhibit area is about? [Is the exhibit about anything else?]
7. Some visitors have told us that some of the terms we used were not appropriate for all audiences, what do you think? [Why?]
8. Finally, compared to the other parts of the downstairs aquarium, what are your quick reactions to the exhibit's appearance and layout? [prompt: wall colors, pictures, etc.]
9. Is this your first visit to the Academy? Yes No
10. What is your age? _____

Appendix C: Structured Interviews Coding Scheme with Visitor Quote Examples

Q2. What, if anything, about these iPads seemed confusing or hard to use?

[prompt: design, layout]

No issues

“No, it's pretty basic.” or “Nothing really, it's self explanatory.”

Screen layout issues

Bottom of screen not visible/understood

“It's hard to figure out what to do with the ones at the bottom.”

Right side of screen not visible/understood

“I didn't know about these [on the right].”

No return to home screen option

“I wanted to go back to the beginning, the first page I was on [text] I couldn't figure out how. I didn't see a home icon to get there [back to beginning].”

Interface issues

Activation delay after touching

“Sometimes when I touched it [the screen] there was a delay, so you could have made it more sensitive.”

Next animal not understood/single animal iPads easier to navigate

“The next tab, I couldn't find the animal. I didn't know what it [next] meant.”

Thought swipe rather than touch

“I thought we might be able to swipe, like an iPhone, but I realized quickly that it's a touch interface.”

Device size/location issues

Device/text too small for multiple people

“No, not really. The iPad size is too small, there are lots of people crowded around. They're trying hard to see with so many people around. It's so small [that] the information is hard to read. I like the big signs out there [aquarium]. Don't they make a bigger iPad? It needs a bigger screen.”

Device mounted too low

“The slug one was too low for me.”

Q3. I noticed you didn't use _____ section(s), any particular reason why?

Did not notice/see section(s)

Right side (bts, next)

"I didn't even notice it [right: bts, next], I just paid attention to this side [bottom]."

Finished using iPad

Spend less time using iPad/more time looking at animal

"It's easier to read what's right there already, not scroll through, and get on to the animal. I just got the information about the animal and looked in the display. That's all I need or want to see [gallery, bts, next]."

Other visitor(s) wanted to stop using iPad

"She [child] gets upset with me when I read everything [right: bts, next]."

Focused on other iPad sections

"It seemed like the main content was here [text], so I just used that [right: bts, next]."

Confused by iPad section function

"It [right: bts, next] looked not very inviting to touch. It was maybe too technical; I wasn't sure what those meant."

Q4. Of the parts you used, which was the most interesting? Why?

Text enhanced exhibit experience

“The animal descriptions and all the pictures happening in tank introductions were great.”

Learned new/more information

“The text [Why?] The details were interesting, things I never knew about the animals.”

Quick/easy to use

“Text. It's clear, nice and short.”

Video enhanced exhibit experience (in general)

“The video. It was interesting to read...”

See otherwise static animals in action (ex. snails, slugs)

“The videos--the slugs and snails tend not to move a lot, so you can see them move on the video.”

See rarely occurring behavior (ex. birth, sex, mating rituals)

“The video—you see aspects you wouldn't get to see each day, like birth, you'd have to get lucky on timing.”

Less to read

“The video. It's nice to see, sometimes there's so much to read, and it's nice to just watch.”

Photos enhanced exhibit experience

Quick/easy to use

“The pictures with the text. [Why?] I don't know, it's quick information.”

See animal in different poses

“The pictures [Why?] It [the animal] is just stationary in the cage. With the pictures, you get to see different poses.”

Learned new/more information

“The pictures...it gives more information.”

Q5. Compared to the live animal displays, would you say the iPad enhanced, detracted or made no difference in what you thought about live animal displays? How so?

How the iPads enhanced the live animal display

Learned new/more information

"I see more information and stuff."

See more of the animal's behavior/details

"If they're not moving around in there [display] you can find out more about the animals in the tanks."

Increased interest in/relevance of animal

"The toad is boring, it doesn't look exciting, but after learning about the eggs, it becomes distinct and makes it more interesting."

Helped in animal identification/location

"It was nice to see what you're looking at, what you find in the display."

How the iPads detracted from the live animal display

Distracted from live animal display

"I felt like it distracted from the display. I paid more attention to it [iPad] than the display."

How the iPads made no difference

Only basic information

"It's just a different way to see the information. I'm sure all the information and sections are great, but if you just want the name and picture then this doesn't enhance, it's just basic and important."

Rather look at actual animal in display

"It didn't take away, but I didn't focus on it. I wanted to look in the display, at the actual thing. This [content] I can look at home."

Q6. What would you say this exhibit area is about? [Is the exhibit about anything else?]

Reproduction, mating, attraction, sex (in general)

“Animal mating.” or “Reproduction.”

Behavior/process

“How animals attract one another to reproduce. Their reproductive methods.”

Birth

“Mating, birth, stuff like that.”

Beauty

“Beauty is in the eye of the beholder.”

Nature/animals

Forms of life

“It's about life, forms of life.”

Habitat/environment

“The forest and the underground creatures.”

Snails

“Snails.”

Camouflage

“Camouflage, extraordinary animal life.”

About The Academy

Behind the scenes

“And behind the scenes, too, we never get to see that.”

Trying new exhibition techniques

“Experimentation, like with iPads.”

Nothing to add

“I can't think of anything else.”

I don't know/not sure

“I don't know what deeper meaning after just viewing this much.”

Q7. Some visitors have told us that some of the terms we used were not appropriate for all audiences, what do you think? [Why?]

Appropriate terms (general)

"I didn't find anything inappropriate."

Scientific terms presented in science institution

"I don't have a problem. They're scientific names and you're in a scientific institution."

Scientific/actual/correct name

"No, because it's scientific. You use the actual name, it's not derogatory. It's different if it's cartoons, but this is the real animal."

People are already exposed to terms

"It's nothing that everyone hasn't seen before."

A good place to find out about content

"If they don't find out here, they're gonna get it from somewhere else. Better that it's here."

Kids are old enough/old enough to read

"I'm fine with it. It's appropriate. I can think of a lot of names you shouldn't use and you didn't use them. If you're old enough to read, you're old enough to learn about this."

Inappropriate terms

Adults not ready to talk about sex with children

"I agree with that. It's okay for kids of a certain age, if they've had sex ed., but little kids, if they read certain words, they [parents] might not be ready to answer questions or have that conversation at that time."

Kids too young

"It's a little mature. I'm not sure if a child his age [9 years] would understand or should be exposed. I suppose it's the parent's discretion."

Substitute terms (ex. mate vs. sex)

"I think they should use 'mate' instead of 'sex.' I just think you're going to get complaints about the word sex and kids will giggle."

Subject inappropriate for kids

"A little weird at first, it made me a little uncomfortable. Why would you bring a kid into an exhibit about mating?"

Appropriate, but understand the issue

May be an issue for those with kids

"I don't think so--we've got European sensibilities, so it's fine. If we were parents, it might be different."

May be an issue for younger audience

"If you [kids] were younger I wouldn't have brought you guys in here. I would have to explain a lot of things to you, but at their age now, I wouldn't have a problem."

Terms were unexpected/surprising

"I think you're talking about penis and I don't mind it, it's natural, but I can understand how it might surprise some people."

Q8. Finally, compared to the other parts of the downstairs aquarium, what are your quick reactions to the exhibit's appearance and layout? [prompt: wall colors, pictures, etc.]

Positive reactions

Colors are inviting/bright/attractive/interesting/warm

"I like it. It's blue and dark everywhere else and in here it has bright colors and art."

More photos

"It's nicer than the other exhibits; you get to see more pictures..."

Generally bright(er)/inviting

"It's a lot more appealing, being brighter. It's more stimulating than the dark deep ocean part."

iPads are attractive/cool/interactive

"It's eye catching, the color, the monitors, seeing the iPads on the wall draws me in. I want to see what's going on there."

More variety of species

"It's inviting, it's brighter, not blueish/gray. Also, I was expecting to see only fish, but there's a mantis and slugs, too."

More information

"It definitely stands out, not like the rest. This smaller area has more information; it feels like I'm learning more."

More modern

"It's eye catching; I like the iPads; it makes it more modern, tech oriented."

Negative reactions

Small displays

"It's attractive, the colors are bright, the photos are nice, but some of the displays could be bigger."

Too much/busy

"It's a lot busier than a lot of other areas, whimsical. You should make it clear that you're going to learn something in here. A big sign that indicates what the exhibit is about. It just looks like a decorated area."

No pictures, just live animals

"I don't think people want to see the pictures so much, they just want to see the live animals. At least I do. I can read a book or more about them anywhere."

Impartial reaction

Colors are different

"Walking in here, you know it's a different exhibit."

Looks like exhibit is for kids

"Initially I thought it was a kids theme because of the colors, but it's about much different things."

Didn't notice surroundings, just live animals

"I didn't notice one way or the other. We saw the animal displays and didn't notice much about the walls."