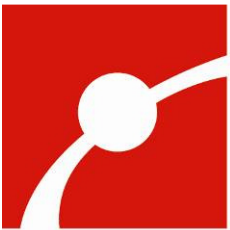


Visitor Experiences in the Art/Science Gallery Summative Evaluation

Report Written by Leigh Ann Mesiti and Anna Lindgren-Streicher
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This report was produced by the Research and Evaluation Department of the Museum of Science, Boston and commissioned by the Art/Science project team. Questions or comments about the study findings should be directed toward the Research and Evaluation Department. Questions or comments concerning the Art/Science gallery should be directed towards the Art/Science project team.

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EXECUTIVE SUMMARY

The Art/Science gallery came into existence during the Fall of 2009. It was designed to hold exhibitions showcasing artistic beauty and creativity, alongside scientific concepts and culture. Due to the nature of its subject matter and separation from other areas of the Museum, it was intended to elicit a more emotional and contemplative experience, where visitors could ponder issues brought up in the gallery and learn new information that might shift a perspective.

This study will showcase the two most recent exhibits in the Art/Science gallery: *What I Eat: Around the World in 25 Diets* and *Bonsai: Creating Art with Nature*. It describes how visitors interact with these two exhibits in the gallery space and which connections to art and science content are they taking away from their viewing experience. It also provides a broad picture of how visitors perceive the Art/Science gallery space, the value they place on its offerings, and which changes could be made for future Art/Science exhibits. By analyzing this information from two different exhibits that were shown in the same space, themes emerged across both exhibit experiences and may inform the exhibit team more broadly about the gallery's audience and effect on visitors.

The evaluation questions guiding this study addressed the two exhibits, as well as the context of the gallery in which they were displayed:

What I Eat: Around the World in 25 Diets and *Bonsai: Creating Art with Nature*

- In what ways are visitors interacting with the exhibits?
- What do visitors find most interesting about the exhibits?
- Which connections are visitors making with art and science from these exhibits?
 - Does this add value to their overall Museum experience?

Art/Science gallery space

- What audience attends the Art/Science gallery?
- What are the enjoyable aspects of the Art/Science gallery space?
- How do visitors describe their experience in the Art/Science gallery space?
- How important is it that a science museum has exhibits like *25 Diets/Bonsai* (art in the middle of a science museum)?

Which changes can be made to improve the Art/Science gallery experience?

Overall, visitors were interested in *What I Eat: Around the World in 25 Diets* and *Bonsai: Creating Art with Nature*, in addition to being able to make art and science connections using the content from both exhibits. They tended to rate inclusion of art and science exhibits at the Museum of Science high on the meaningful scale and offered thoughtful responses to support their rating. Their comments primarily detailed how the two disciplines (art and science) were related, particularly looking at how art can make science more accessible. Visitors also explained through variety of themes how their experience in the Art/Science gallery is different than what they might experience in other areas of the Museum. They appreciated aspects of the gallery such as its calm atmosphere, gallery design, simplicity, and changing content. All of these aspects indicate that the Art/Science gallery and their exhibits are valuable to the audience who visits this space. This audience may not be coming exclusively to view exhibits in this gallery, but their experience at the Museum is more meaningful because of what this gallery has to offer.

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I. INTRODUCTION

The Art/Science gallery came into existence during the Fall of 2009. It was designed to hold exhibitions showcasing artistic beauty and creativity, alongside scientific concepts and culture. Due to the nature of its subject matter and separation from other areas of the Museum, it was intended to elicit a more emotional and contemplative experience, where visitors could ponder issues brought up in the gallery and learn new information that might shift an perspective.

This study will showcase the two most recent exhibits in the Art/Science gallery: *What I Eat: Around the World in 25 Diets* and *Bonsai: Creating Art with Nature*. The Museum of Science exhibition, *What I Eat: Around the World in 25 Diets* (*25 Diets*), opened June 2011 and ran through the end of February 2012. This exhibit, based on the award-winning book by photographer Peter Menzel and writer Faith D'Alusio, used photojournalism to explore the daily lives and food portraits of 25 people spanning 17 countries around the globe. This exhibit was intended to challenge viewers' assumptions about eating by highlighting the similarities and often extreme differences in how a variety of people and cultures approach and consume food. Photos of this exhibit can be seen below (Figures 1-4).



FIGURE 1. Introduction panel



FIGURE 2. Gallery and table interactives



FIGURE 3. Detail of the photo stations



FIGURE 4. Couches with the *25 Diets* book

The Museum of Science exhibition, *Bonsai: Creating Art with Nature (Bonsai)*, opened late in March 2012 and ran through the beginning of June 2012. This exhibit focused on the artistic and botanical aspects of bonsai by featuring a rotation of seven living bonsai trees in the gallery. The exhibit also educated visitors about the process and tools used in designing the trees, as well the different styles and origins of this art. Photos of this exhibit can be seen below (Figures 5-8).



FIGURE 5. Introduction panel



FIGURE 6. Detail of a bonsai tree



FIGURE 7. View of the gallery



FIGURE 8. Tools and Techniques panel

This comparative study of the *25 Diets* and *Bonsai* exhibits, in context of the Art/Science gallery, describes how visitors interact with these two exhibits in the gallery space and which connections to art and science content are they taking away from their viewing experience. It also provides a broad picture of how visitors perceive the Art/Science gallery space, the value they place on its offerings, and which changes could be made for future Art/Science exhibits. By analyzing this information from two different exhibits that were shown in the same space, themes emerged across both exhibit experiences and may inform the exhibit team more broadly about the gallery's audience and effect on visitors.

The evaluation questions guiding this study addressed the two exhibits, as well as the context of the gallery in which they were displayed:

What I Eat: Around the World in 25 Diets and *Bonsai: Creating Art with Nature*

- In what ways are visitors interacting with the exhibits?
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Art/Science gallery space

- What audience attends the Art/Science gallery?
- What are the enjoyable aspects of the Art/Science gallery space?
- How do visitors describe their experience in the Art/Science gallery space?
- How important is it that a science museum has exhibits like *25 Diets/Bonsai* (art in the middle of a science museum)?
- Which changes can be made to improve the Art/Science gallery experience?

II. METHODS

This study used multiple methods to discover how visitors interacted with the exhibits and with the gallery space, as well as to understand the overall visitor experience in the gallery. People who visited the two exhibitions, *What I Eat: Around the World in 25 Diets* and *Bonsai: Making Art from Nature*, were observed and then prompted for an interview. A total of 98 groups were observed or interviewed over the course of this evaluation.

Data Collection

Timing and tracking methods were used to record how visitors navigated the exhibition and how long they spent in the gallery. Groups of visitors 12 or older were observed and data collectors noted which components of the exhibition were visited, as well as how visitors interacted with the components, with their group members, with other visitors, and with the space. For *25 Diets*, much of the exhibit's content was portrayed through text alongside images, so tracking and timing hoped to inform the team as to how much reading and discussing visitors do while viewing the exhibition. The *Bonsai* exhibit had a different format and less reading than *25 Diets*, so comparisons were made to see how visitor behaviors and time spent in the gallery differed from one exhibit to the next. A total of 82 groups were observed in the Art/Science gallery, 30 of which were during the *25 Diets* exhibition and 52 during the *Bonsai* exhibition. Because of time restrictions noted below for recruitment of groups to interview, a much larger number of groups were observed during the *Bonsai* exhibition, as far fewer visitors spent more than three minutes in the gallery during data collection than had done so in *25 Diets*.

Exit interviews were conducted with visitors to the space as well. For both exhibitions, only visitors who spent a minimum of three minutes exploring the space were asked to participate in an interview. During each interview, adults 18 or older within each group were targeted, though children under 18 may have answered questions with parental consent. The interview probed visitors to discuss their interest in and attitudes toward the exhibit content, how they described the Art/Science space, and if they had qualitatively different experiences in the space as compared to other exhibition areas at the Museum of Science. Interview questions also inquired about any connections visitors made to art and science that were prompted by their visit to either of the two exhibitions and if they would recommend any changes that could be made to improve their experience in the gallery. The interview primarily included open-ended questions which allowed visitors to express their thoughts about the exhibitions and the gallery space using their own descriptive vocabulary. Demographic information, including group composition, member status, and last visit to the Museum of Science, was also asked of interview participants. Observation and interview instruments used for this evaluation are available in Appendices A and B respectively. Floor plans for both exhibitions are also available in Appendix C.

Data Analysis

Data collected from each exhibition were analyzed through the use of descriptive statistics, including counts and means, as well as through open coding of qualitative data. In order to compare across both exhibits, data were first analyzed using broad categories that helped to determine larger themes in terms of visitor experience and interaction with exhibit components

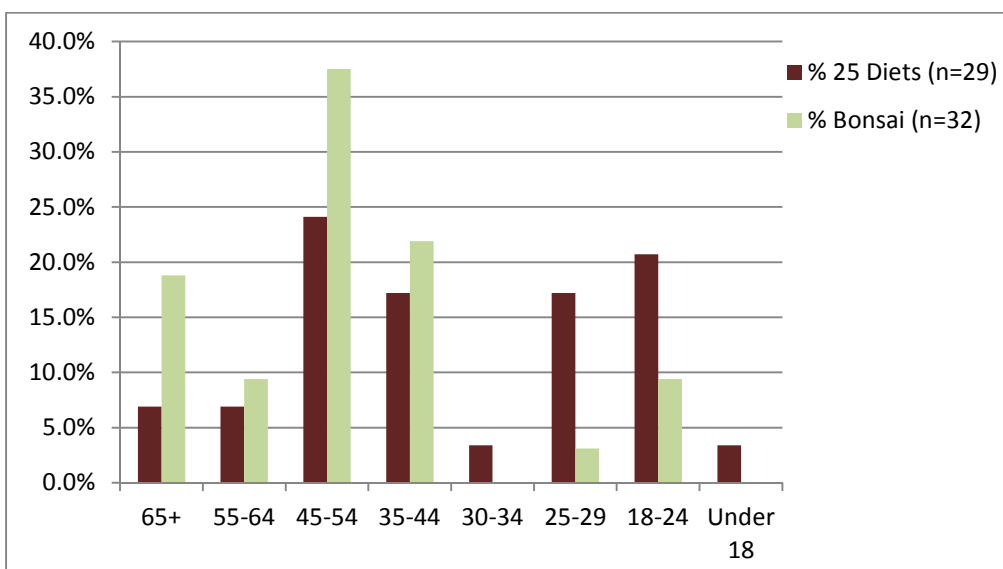
and gallery space. Data were then further coded within the individual exhibits to provide support and illustrate the broad categories. Sample responses for each question and code for both exhibits are included in Appendices E and G.

In addition to data gathered from data collection across the *25 Diets* and *Bonsai* exhibitions, data from the Public Visitor Experience Monitoring Project (VXM) were used to support study findings by checking visitor demographics, visitation rates, and quality ratings pertaining to the Art/Science gallery. The VXM project uses an online survey tool to monitor the quality of the visitor experience at the Museum of Science and steward the Museum’s relationship with our visitors. It regularly gathers feedback from Museum visitors who are randomly selected on the Museum floor to provide an email address. Using both sets of data, this evaluation can provide a multifaceted view of who visits this space and what kind of experience they have while inside the gallery.

Sample Demographics

During the study, 35 groups (75 visitors) were observed and/or interviewed about *25 Diets* and 63 groups (93 visitors) were observed and/or interviewed about *Bonsai*. A total of 62 groups were interviewed during the course of this evaluation, 46 of which were also observed. Of the visitors interviewed in *25 Diets*, 39 were female and 36 were male, while 54 of the visitors were female and 39 were male in *Bonsai*. There were high percentages of non-members in both exhibit samples (*Diets* 62.1%; *Bonsai* 65.6%). First time visitation was high in the *Bonsai* sample (31.3%), whereas the highest percentages of *25 Diets* visitors had visited within the past 2 years (58.6%). Visitors from both exhibit samples were most likely to be between ages 45-54. However, *25 Diets* seemed to attract both a middle aged audience and a slightly younger demographic, while *Bonsai* primarily attracted a middle aged to older audience (Chart 1). For full demographic counts and percentages, see Appendices D and F.

CHART1. Ages



III. RESULTS AND DISCUSSION

VISITORS TO *WHAT I EAT: AROUND THE WORLD IN 25 DIETS* AND *BONSAI: CREATING ART WITH NATURE* MAY DIFFER FROM THE OVERALL MUSEUM AUDIENCE.

Data collected through the Visitor Experience Monitoring project (VXM) were used to better understand the demographics of who visits the Art/Science gallery, and the impact of their time in the space on their overall visit. This includes VXM data collected from a sample of Museum visitors during the run of both *What I Eat: Around the World in 25 Diets* (*25 Diets*) and *Bonsai: Creating Art with Nature* (*Bonsai*), in addition to previous VXM fiscal year data pertaining to the Art/Science gallery. In Fiscal Year 2012 (FY2012), VXM data sampled 1278 groups, of which 28.9% (369 groups) had visited the Art/Science gallery. *25 Diets* and *Bonsai* were the only two exhibits that ran during FY2012.¹ The following data explore trends between Art/Science gallery attendees and the overall Museum audience.

The Art/Science gallery is not typically the reason for Museum attendance, but visitors are likely to visit the Art/Science exhibits once inside the Museum.

While on view in the Art/Science gallery from June 2011 to February 2012 (approximately 8 months total), *25 Diets* was visited by 26.2% of VXM respondents (281 of a possible 1,074). Six (of 1,074) visitors specifically came to see the *25 Diets* exhibit (2.0% of Art/Science gallery visitors and 0.6% of total Museum visitors) (Table 1). Overall during this time period, only 2.0% of visitors indicated that they came to the Museum to see a specific exhibit, program or show. *Bonsai* was on view in the gallery for approximately 2 months (March 2012 to June 2012) and it was visited by 43.1% of VXM respondents (88 of a possible 204). Two (of 204) visitors specifically came to see the *Bonsai* exhibit (2.3% of Art/Science gallery visitors and 1.0% of total Museum visitors). This also represents 7.1% of visitors who indicated that they came to the Museum to see a specific exhibit, program or show (during the run of this exhibit). Overall, visitors to both exhibits were not attending the Museum for *25 Diets* or *Bonsai*, but it is a gallery that visitors attend once they are already in the Museum. Additional findings presented in this report will speak more to the experience that these visitors have while attending these exhibits.

TABLE 1. Visitation

	# of potential Museum visitors	% of exhibit visitation	% of Visitors who specifically came to MOS for this exhibit
<i>25 Diets</i> (n=281)	1074	26.2%	2.0%
<i>Bonsai</i> (n=88)	204	43.1%	7.1%
Total (n=369)	1278	28.9%	0.6%

Table 2 (below) shows how these exhibits compare to other Art/Science gallery exhibits by displaying their visitation percentages by exhibit and fiscal year. *Inside the Mind of M.C. Escher*

¹ *25 Diets* opened 4 days before the start of FY12, so data includes everything since the opening of *25 Diets*.

(*Escher*) had the highest visitation percentage of all Art/Science exhibits until the most recent gallery exhibit, *Bonsai* (*Escher* 39.7%; *Bonsai* 43.1%). *25 Diets* with 26.3% is closer in visitation percentage to other earlier Art/Science exhibits.

TABLE 2. Visitation in the Art/Science gallery by exhibit

Exhibit name	FY(s)	# of months on view	% visited
<i>Bonsai: Creating Art with Nature</i>	2012	2	43.1%
<i>Inside the Mind of M.C. Escher</i>	2011	5.5	39.7%
<i>What I Eat: Around the World in 25 Diets</i>	2011, 2012	8	26.2%
<i>Manufactured Landscapes</i>	2009, 2010	5	26.0%
<i>Running the Numbers</i>	2010	6	25.1%
<i>Voices Without Faces, Voices Without Races</i>	2011	4	18.5%

The *Bonsai* interview included a question that directly probed visitors about how they decided to visit the Art/Science gallery. Most respondents came to the exhibit because they were walking by the gallery (56.3%, 18 of 32) and some visitors came because they saw exhibit signage (18.8%, 6 of 32). A few visitors indicated that they had heard about the exhibit through online sources, such as the website or member emails (9.4%, 3 of 32), while two visitors saw *Bonsai* advertised in city pass (6.3%). Groups that indicated an “other” response mentioned an interest or personal connection to *Bonsai* (12.5%, 4 of 32).

The Art/Science gallery is likely to attract experience-driven adult duos and sightseeing families.

In FY2010, an audience segmentation analysis was performed using VXM data to classify visitors based on their reported characteristics and motivations. This segmentation can be helpful in understanding which visitors are drawn to particular experiences and if there are additional characteristics that these groups have in common. Just as this segmentation can give the Museum a better understanding of different Museum audiences and what offerings are most attractive to them during their visit, it can provide an idea of which type of visiting group is likely to attend the Art/Science gallery. Appendix H will provide a more comprehensive look into the four types of segments, but the bulleted list below provides a brief description of the different visiting groups at the Museum of Science:

- **Fun-loving families** are local visitors who come to the Museum to have fun together as a family, nearly all groups include adults and children, over half are members;
- **Education-loving families** are dedicated, local families who come to the Museum to learn together and have fun, nearly all groups include adults and children, many are members;
- **Sightseeing families** are non-local families who want to spend time together at the Museum while visiting Boston, most groups include adults and children, very few are members;
- **Experience-driven adult duos** are pairs of adults who visit the Museum largely to see a specific exhibit, program or show, nearly all are adult-only groups, nearly a quarter are members.

In FY2010 and FY2011, Art/Science exhibits on view during those years were analyzed by audience segmentation and tested for significance (Table 3). This test compared each audience segment’s visitation to the overall visitation to the exhibit, to see if any segment visited more or less frequently when compared to the overall visitation. Compared to the overall Museum attendance of the Art/Science gallery exhibit *Running the Numbers (Numbers)* (25%), sightseeing families at 39% and experience-driven adult duos at 36% had significantly higher than expected visitation rates. In FY2011, Art/Science exhibit *Inside the Mind of M.C. Escher (Escher)* showed a similar trend. Overall Museum visitation was 37%, but experience-driven adult duo attendance reached 61% and sightseeing family visitation reached 50%. For both of these exhibits, fun-loving families had lower than expected visitation rates (*Numbers* 17%, *Escher* 27%) compared to the overall Museum audience (*Numbers* 25%, *Escher* 37%). Significance in segmentation was not found for Art/Science exhibit *Voices Without Faces, Voices Without Races* potentially due to its lower overall visitation (18.5%). Overall this data suggests that experienced-driven adult duos and sightseeing families are the core groups visiting the Art/Science gallery. These percentages show that the Museum’s intention of creating this gallery as an attraction for a more adult audience has been successful.

TABLE 3. Attraction visitation by audience segment²

		Education-loving families	Sightseeing families	Experience-driven adult duos	Fun-loving families	Overall Museum Attendance
Art/Science Exhibits	<i>Running the Numbers (2010)</i>	21%	39%*	36%*	17%*	25%
	<i>Inside the Mind of M.C. Escher (2011)</i>	30%	50%*	61%*	27%*	37%

*indicates a significant difference between the percentage of the audience segment visiting an experience and the overall population.

Although segmentation analysis has not yet been run for FY2012, VXM demographic information regarding group type and membership from this year may suggest similar trends (Table 4). The VXM data asks respondents to indicate how many adults and children were in their visiting group. In FY2012, adult only groups made up 38.4% of Art/Science gallery visitation. This percentage of adult only groups is slightly higher than the percentage of adult only groups found visiting the Museum overall (33.9%).

² Table only includes experiences and exhibitions if there was a significant difference between audience segments in terms of visitation. If segment visitation at an experience is higher than expected based on the overall audience, it is highlighted in red. If a segment’s visitation is lower than expected, it is highlighted in blue. Significance calculated using Chi Square test for independence; p<0.05.

TABLE 4. Group type

	% Adult only groups	% Adult and child groups	Mean # group size	Mean # of kids per group
<i>Diets (VXM)</i>	38.1%	61.9%	3.62	1.40
<i>Bonsai (VXM)</i>	39.7%	60.3%	3.21	1.09
All A/S Visitors (FY2012)	38.4%	61.6%	3.53	1.33
All Visitors (FY2012)	33.9%	66.1%	3.74	2.92

Across all fiscal years, the overall Museum audience has predominantly consisted of more non-members than members (Table 5). However, the percentage of non-member attendance in FY2012 was even higher for Art/Science gallery visitors (73.2%) than the overall Museum attendees. This increase may be influenced by the trend that Museum members are likely to frequent the Museum more often than non-visitors. Because they are likely to visit the museum more often, it’s possible that these groups are not visiting every gallery during each Museum trip, as opposed to non-members who are likely to visit as much of the Museum as possible during their trip. This membership links to the segmentation analysis because sightseeing families and experience-driven adult duos are also less likely to have Museum memberships than other groups.

TABLE 5. Visitation by membership

Member Status	% FY2009	% FY2010	% FY2011	% FY2012	% Art/Science Gallery FY2012
Non-member	67.8%	62.1	61.2%	62.2%	73.2%
Member	32.2%	37.9	38.8%	34.8%	26.8%

Museum loyalty ratings are likely unaffected by Art/Science visitation.

When looking at the VXM Museum loyalty and experience ratings, Art/Science visitation did not appear to have an impact. These are ratings that ask visitors to indicate the quality of their Museum visit on a Likert scale that extends from 0 to 10, with 0 representing a highly negative response and 10 representing a highly positive response. The loyalty ratings as visitors about the following six categories: the quality of the Museum as an educational experience, the quality of the Museum as an entertainment experience, their likelihood of recommending the Museum to a friend or colleague, their likelihood of returning in the next 12 months, overall value of the experience compared to cost, and their likelihood to purchase or renew a membership. The experience ratings refer to ten aspects of a Museum experience that are considered high priority areas for visitors and the Museum. These ratings can indicate to the Museum how to improve the visitor experience. For example, some of these aspects include: “There were things I wanted to see or do,” “Staff members were helpful,” “Exhibits were in good working order,” and “Restrooms were clean.” Overall, visitor loyalty and experience ratings are both high from Art/Science gallery visitors, as well as non-visitors, and there are no significant differences in how visitors are rating these indicators based on their visitation to the Art/Science Gallery. Previous analysis of VXM data has indicated that it is difficult for one aspect of Museum visitation to shift these ratings.

FORMAT, CONTENT, AND ARTIFACTS HAVE AN EFFECT ON VISITOR INTERACTIONS IN THE ART/SCIENCE GALLERY.

Text to image ratios, in addition to layout may affect dwell times.

Average dwell times in the two exhibits varied by approximately 12 minutes. Visitors spent more time in *What I Eat: Around the World in 25 Diets*, which had an average of 15.8 minutes, than in *Bonsai: Creating Art with Nature*, which had an average of 4.1 minutes. This may in part be attributed to the amount of text to read in each gallery and how each exhibit was organized.

The *25 Diets* exhibit contained 25 photo stations that were placed along the wall with an accompanying label that described each photo (See Appendix C for exhibit floor plan). Interviewed groups visited an average of 20.2 photos and read labels at an average of 17.93 photos. Some visitors interacted with the book of photos or table-top activities (16.7%, 5 of 30). In general, visitors in this gallery visited and/or read most of the exhibit content. The exhibit also had an organized flow, where groups tended to view and discuss one photo at a time, moving around the gallery in a clock-wise fashion. Visitors were likely to skip to the next photo in line, but not skip around the whole gallery. In many cases where visitors skipped photos, they did so because another visitor was currently at their next photo station. Compared to previous exhibits at the Museum of Science, average dwell times for *25 Diets* were close to dwell times of more interactive exhibits of similar size. Summative evaluations of the following exhibits provided data about these dwell times: *Investigate* (1996, pre-refurbishment) at 17.1 minutes, *Natural Mysteries* (2001) at 13.3 minutes and *Invention at Play* (2004) at 12.6 minutes. Even though *25 Diets* had fewer interactive opportunities than the mentioned exhibits, it appears that the pairing of descriptive photos and narrative text was dynamic enough to maintain visitor interest.

The *Bonsai* exhibit contained seven trees, six which were clumped in groups of three and one tree stood alone. The trees were accompanied by a label that had indicated its species and age. Along the walls, there were some panels with more textual information about bonsai trees (See Appendix C for exhibit floor plan). The exhibit did not have an obvious viewing order. Visitors tended to enter the gallery and head straight for the trees toward the back of the room. They were more likely to skip around the gallery and stop at panels that grabbed their attention. Dwell times in this gallery were much shorter than *25 Diets*, at 4.1 minutes, but were similar to other exhibits at the Museum of Science. Summative evaluations provided data about the following exhibit dwell times: *Welcome to the Universe* (2009, pre-refurbishment) at 5.9 minutes, *New England Habitats* (1989, pre-refurbishment) at 5.3 minutes and *Energized* (2011) at 3.3 minutes). *Welcome to the Universe* and *New England Habitats* were similar in style to *Bonsai*, where there were images or dioramas on view and the gallery space is more contained. The recently installed *Energized* exhibit has components that are more interactive and it spans a larger, more open space in the Museum.

Data from these two exhibits suggest that that content and format may accentuate different exhibit strengths because *25 Diets* and *Bonsai* were successful in two different ways. To date, *Bonsai* presented the highest visitation percentages of any exhibit in the Art/Science gallery (43.1%), but on average, groups stayed in the gallery for a shorter amount of time (4.1 minutes).

The subject area may have interested more visitors, but there was less content, or fewer panels to read, in the exhibit. *25 Diets* did not have the same attraction power as *Bonsai*, as its visitation was closer to percentages seen for earlier Art/Science exhibits (*Diets* 26.2%). However, its average dwell time of 15.8 minutes indicates that visitors who did view the exhibit were likely to read through much of the provided content.

The layout and atmosphere presented by an exhibit can elicit different visitor behaviors and requests.

Observation data that tracked and tabulated visitor interactions with aspects specific to each exhibit can be found in Appendices D and F. However, both galleries displayed three panels detailing the same type of information: exhibit introduction, artist statement and “Why art at the Museum of Science?” (art/science connection text). Introductory text was located on the free-standing wall in front of visitors as they entered the gallery, the artist statement was located on the left wall beside the entrance and “Why art at the Museum of Science?” was located on the right wall beside the entrance. The placement of these panels and how the overall exhibit was organized, rather than panel content, played a larger role in the percentage of visitors who read this information.

The artist statement was read most frequently by visitors in the gallery (*Diets* 26.7%, 8 of 30; *Bonsai* 36.5%, 19 of 52).³ Visitors read this panel more frequently in *Bonsai* than *25 Diets*. Upon entering *Bonsai*, visitors tended to head toward the right of the gallery (toward the trees), potentially passing by the artist statement on their way out of the space. For visitors who read this panel in *Bonsai*, it was likely their final stop in the gallery. For *25 Diets* visitors, this panel was in the same location as *Bonsai*, but it was placed directly beside the first photo station. Most visitors were more attracted to the photo and often skipped over the artist statement that had no image.

The introductory text was read by a similar percentage of visitors in both exhibits (*Diets* 26.7%, 8 of 30; *Bonsai* 26.9%, 14 of 52). Although this text was in front of visitors upon entering each exhibit, visitors tended to immediately move to the right or left of the wall, jumping right into the exhibit content. “Why art at the Museum of Science?” was not read by many visitors in either exhibit (*Diets* 3.3%, 1 of 30 and *Bonsai* 11.5%, 6 of 52). This panel may have received less attention because it was not immediately visible to entering visitors and it was isolated from more dynamic parts of the exhibit. In *Bonsai*, it was placed on an empty wall, away from the trees and content panels and in *25 Diets* it was above a group of chairs, also separated from the main content.

The purpose of the introduction panel, artist statement, and art/science connection text are perhaps useful as background to the exhibits, but do not appear to be essential to the exhibit experience. They are available to visitors as additional ways to understand information about the exhibit and provide context for the exhibit’s inclusion in the Museum. They may give visitors a

³ Data collectors only noted information for the introductory text, the artist statement, and “Why art at the Museum of Science?” panels for the tracked individual in each group. These percentages do not include other group members that may have read these panels.

more thorough understanding of why this exhibit displayed at the Museum of Science, but viewing it did not seem to affect visitor learning or interest in the gallery.

The setting created by each exhibit also plays a role in how visitors interact with the exhibits and which requests they may make regarding the space. This was apparent in the seating arrangement for *25 Diets* and *Bonsai*. In *25 Diets*, seating options consisted of one double sofa and two single sofas circled around a table, near the gallery entrance, in addition to the chairs around the activity tables located in the center of the gallery. In *Bonsai*, seating options consisted of one double sofa and single sofa near the redwood tree, in addition to a single sofa placed along the wall near the entrance. More seating was available in the *25 Diets* exhibit, but only 13.3% of visitors (4 of 30) took advantage of the seating. Two visitors did remark “*It’s nice to have the seating*” (Female, 45-54) and “[*I like how*] *there are places to sit*” (Male, under 18). One visitor did request more seating “*opposite the pictures so you can sit and dwell on a picture*” (Female, 60s). In *Bonsai*, 26.9% of visitors (14 of 52) used the provided seating. Even though there was less seating available in *Bonsai* compared to *25 Diets*, visitors used it almost twice as often. This may be attributed to the configuration of seating; the sofas in *Bonsai* were in the center of the gallery, whereas the sofas in *25 Diets* were off to the side of the gallery, away from the photos. Four visiting groups in *Bonsai* requested additional seating, one commenting that “*I like that there’s a bench so you can reflect, but have more!*” (Female, 45-54). Seating can be useful for a variety of reasons, including giving visitors an opportunity to rest or take in their setting. This was particularly apparent in *Bonsai*, where visitors were thinking about the space more as an “atmosphere” than a content space. It seems that visitors were looking for more places to contemplate what they were seeing and feeling, experiencing the exhibit in a way that’s different than learning content. It’s possible that additional seating could have increased visitor dwell times. Also, this sense of atmosphere seems to illustrate what the team is trying to achieve through the Art/Science gallery.

Another behavior seen in *Bonsai* was taking photos. In this exhibit, 15.4% of visitors (8 of 52) took photos in the gallery, while this was not a noted behavior in the *25 Diets* exhibit. This again speaks to the type of experience *Bonsai* provides. For visitors, bonsai trees are not typically displayed in science museums. It appears that the composition of the trees warranted photos. One can capture the beauty and essence of the trees on camera without requiring additional information to interpret or appreciate the photo. Taking a photo captures a memory that can be referred to after his/her time at the Museum is over. It’s not surprising that this behavior was not seen in *25 Diets* because what made the photos in that exhibit interesting or important was the information one learned from the text that described the people and the diets being portrayed. Thinking about the Museum as a whole, visitors in other areas of the Museum do take photos, but it’s more likely to be photos of them participating with each other or an interactive in the Museum, rather than a photo of the display itself. This further supports that exhibits in the Art/Science gallery have to potential to create a different type of experience than other areas of the Museum can provide.

THE ART/SCIENCE GALLERY CAN OFFER AN INTERESTING VISITOR EXPERIENCE.

All visiting groups to What I Eat: Around the World in 25 Diets and Bonsai: Creating Art with Nature were interested in the exhibits and were particularly drawn to the exhibit content.

Groups interviewed during the study were asked to indicate on a scale of 1 to 4 how interested they were in *What I Eat: Around the World in 25 Diets* and *Bonsai: Creating Art with Nature*.⁴ All interviewed groups were interested in the *25 Diets* and *Bonsai* exhibits. For *25 Diets*, 37.9% (11 of 29) of visitors were interested and would visit again, while 62.1% (18 of 29) were interested but would not visit again. For *Bonsai*, 65.6% (21 of 32) were interested and would visit again, while 34.4% (11 of 32) were interested but would not visit again (Table 6).

TABLE 6. Visitor interest

	% Interested, I'd visit again	% Interested, but I wouldn't visit again	% Wasn't really interested	% Didn't find it interesting at all
<i>25 Diets</i> (n=29)	37.9%	62.1%	0.0%	0.0%
<i>Bonsai</i> (n=32)	65.6%	34.4%	0.0%	0.0%

Although the content presented in *25 Diets* and *Bonsai* was different, visitors referred to exhibit content as what interested them most about the exhibits they viewed. For the context of this study, exhibit content referred to any topic directly related to each of the exhibits. For *25 Diets*, all (29 of 29) groups were interested in the calories and diets seen across different individuals, or how the exhibit gave them the opportunity to look at food and hear stories from around the world. A comment from one visitor who came specifically to see the *25 Diets* exhibit speaks to some of the content discussed by visitors by saying, “*I'm interested in food across cultures, in eating disorders across the world. I like to find common ties that transcend boundaries - food is something that always brings people together*” (Female, 25-29). For *Bonsai*, 81.3% (26 of 32) of groups were intrigued by the content. Many visitors enjoyed looking at the trees themselves and shared comments such as: “[*there are*] *different types I haven't seen before, like the redwoods*” (Female, 45-54). Other visitors enjoyed discovering the age of the trees and learning about the dedication required to maintain the trees. One visitor illustrated these concepts by saying he was interested in “*the pictures of the progression. I didn't know it took so long to grow them and shape them*” (Female, 35-44). Additional information about coding and sample responses can be found in Appendices E and G.

A third of visitors from each exhibit shared aspects of their experience that would encourage them to return to the Art/Science gallery (*Diets* 34.5%, 10 of 29; *Bonsai* 34.4%, 11 of 32). For some of these visitors, the exhibit presentation was important to their attraction to the exhibit (*Diets* 6 of 10; *Bonsai* 3 of 11). For *25 Diets*, many of the comments (4 of 6) were associated with the visual element of photographs, saying that “*the visual element draws you in*” (Male, 25-29). One visitor did appreciate “*the way they have the facts, how it's laid out.*” For *Bonsai*, comments regarding exhibit organization were more frequent (3 of 3), such as “*the information*

⁴ Interest Scale: 1= “I was so interested that I'd visit again”; 2= “I was interested, but I wouldn't visit again”; 3= “I wasn't really interested”; 4= “I didn't find it interesting at all.”

presented is simple and straightforward, so for her [female, ~10] it's perfect. It's not cluttered" (Male, 45-54).

Another experience aspect that specifically *Bonsai* visitors appreciated was seeing a “live” exhibit (4 of 11). Data detailing attendance from other Museum exhibits, captured by the VXM project, supports this response by indicating that exhibits with “live” elements, such as plants or animals, typically draw higher numbers than exhibits without this “live” component (Lindgren-Streicher, et al, 2011). Table 7 shows a trend that all previous traveling exhibits incorporating animals or plants had attendance above 40%. Exhibits, such as *Frogs and Reptiles: The Beautiful and the Deadly*, that displayed real-life animals had 66.7% and 58.3% respectively.

TABLE 7. Visitation of Traveling Exhibits

Exhibit name	FY(s)	% visited
<i>Frogs</i>	2009	66.7%
<i>Whales/Tohorā</i>	2011	63.4%
<i>K'NEX: Building Thrill Rides</i>	2011	59.1%
<i>Reptiles: The Beautiful and the Deadly</i>	2011	58.3%
<i>Harry Potter: The Exhibition</i>	2010	53.0%
<i>Mythic Creatures</i>	2009	45.6%
<i>Crittercam</i>	2009, 2010	45.1%
<i>RACE: Are We So Different?</i>	2011	39.1%
<i>Black Holes</i>	2009, 2010	37.4%
<i>Identity</i>	2010	37.4%
<i>Diabetes: A Deeper Look</i>	2011	35.4%
<i>George Washington Carver</i>	2011	25.3%
<i>LaserLab</i>	2011	23.8%
<i>Wild Music</i>	2010	23.7%

Five visiting groups (*Diets* 13.8%, 4 of 29; *Bonsai* 3.1%, 1 of 32) were not able to describe an aspect of the exhibit that would encourage them to return. These visitors responded with “*No, but it was nice to see*” (Female, 45-54), “*I don't know*” (Female, 18-24) or made a comment about living far away.

The Art/Science gallery can provide a social experience.

Over half of the visiting groups conversed with each other in the gallery space (*Diets* 63.3%, 19 of 30; *Bonsai* 71.2%, 37 of 52). This is less surprising seeing that over half of visiting groups in both exhibits walked around the gallery with at least one other group member (*Diets* 63.3%, 19 of 30; *Bonsai* 57.7%, 30 of 52). It seems that groups who walked around the gallery with others were likely to discuss the exhibit, and even some visitors who walked around on their own still conversed with group members during their time in the space. Overall, visitor conversations in both exhibits indicated varying degrees of wonderment and impressiveness with the exhibit on view. For 25 *Diets*, some visitors were inquisitive about the appearance of the subjects in the photographs. They often expressed disbelief of how the person in the photograph related to the diet described in the text. One visitor commented, “*It's funny- some of these people eat so much and are so skinny*” (Male). Other visitors discussed content related to calories, lifestyle, and food, such as “*This guy [the oil rig owner] eats 6,000 calories, but he works this job*” (Female, 55-64). In *Bonsai*, content was discussed in the context of the age and size of the trees, their

beauty and the tools used. Visitors were likely to remark “Wow. Look at that. It takes a long time! [looking at the panel *Three Bonsai Over Time*]” (Female, 40s) or “Look at the tools!” (Female, 30s). In both exhibits, visitors were also making personal connections, whether they were connecting their diet to the diets presented or expressing interest in wanting to do bonsai themselves.

Changing or rotating content in the exhibits may encourage visitors to visit the same exhibit more than once.

The percentage of people who were interested and would visit the exhibit again was higher for *Bonsai* (65.6%) than *25 Diets* (37.9%). For both exhibits, visitors seemed to value having the opportunity to see an element of the exhibit changed in some way, so that their following Museum trip might offer new content or visuals that they were unable to see during a previous visit (*Diets* 2 of 29; *Bonsai* 6 of 32). This concept was already being utilized in the *Bonsai* exhibit because the trees were being replaced throughout the 2 month display period. Visitors who recognized this action made remarks such as, “I see you change them [the trees] every few days, so we'd come back to see what changes you make” (Male, 35-44). In *Bonsai*, visitors seem to feel that if the bonsai trees were being swapped out during the exhibit run, there was potential to see a different tree on view if they came to the Art/Science gallery on a subsequent visit. In the context of the *25 Diets* exhibit, the two visitors remarked, “If they changed the people I'd see it again” (Male, 35-55). As opposed to *Bonsai*, the people in *25 Diets* did not rotate during the run of the exhibit, so this may partially explain the difference in the percentages of people who were interested in returning.

THE ART/SCIENCE GALLERY IS A SPACE WHERE VISITORS CAN UNDERSTAND AND APPRECIATE ART AND SCIENCE CONNECTIONS.

Many interviewed groups were able to identify art and science connections in What I Eat: Around the World in 25 Diets and Bonsai: Creating Art with Nature.

Over half of the interviewed groups identified both art and science elements in *What I Eat: Around the World in 25 Diets* and *Bonsai: Creating Art with Nature* (*Diets* 58.6%, 17 of 29; *Bonsai* 56.3%, 18 of 32). In *25 Diets*, responses detailed how the exhibit uses art to visually depict science and nutrition. For example, one respondent said that, “The art is through the images trying to convey the diets. The science is the detailed explanation of what food is presented in the images” (Male). Another group offered that, “[It's] the story with science behind it (Male, 18-24). Aesthetically, what they ate, not just a calorie count” (Female, 60s). In *Bonsai*, visitors mainly detailed how designing and maintaining the growth of bonsai trees connects to both art and science. One visitor illustrated this by saying, “Art of course is growing the trees- you have to be an artist to do that. The science is how, how to keep them alive, etc...” (Female, 45-54). A younger visitor said that “the trees, it takes, you need to know science but also an art because it's kind of like turning the trees into pictures” (Female, ~8). Additional information regarding coding and sample responses for both exhibits can be found in Appendices E and G.

Some visitors only identified science or art, but not both, in the two exhibits (*Diets* 27.6%, 8 of 29; *Bonsai* 31.3%, 10 of 32). In this case, the majority of these visitors articulated science connections. Visitors in this category may have considered the art aspect as a “given” not worth mentioning or they did not make an art connection in the exhibit. In *25 Diets*, these visitors focused on how food intake affects one’s health and body (7 of 8). This included responses such as, “*Nutrition is a science, well has a scientific basis. Calories as a measure of energy- that definitely connects to science*” (Male). In *Bonsai*, these visitors either spoke about the method of manipulating and controlling tree growth or they were more general about plant life (9 of 10). One visitor explained that it was science “*because the ancient Chinese figured out scientific ways to make trees look the way they wanted*” (Male). Another visitor offered that “*...plant life is botany*” (Female, 55-64). The group who only specified art in the *25 Diets* exhibit focused on the portraits in *25 Diets* and mentioned that there could have been more nutritional information. The group who only identified art in *Bonsai* connected working with nature is living art and also thought there could have been more science. Both groups who only articulated art connections also offered that there could have been more science incorporated into the exhibit.

Although most visitors did make some type of connection to art and/or science, 18.8% of *25 Diets* visitors (6 of 29) and 9.4% of *Bonsai* visitors (3 of 32) did not make these connections. In *25 Diets* some of the visitors made cultural connections, rather than art/science connections (3 of 6), while others did not see any connections. In *Bonsai*, a few visitors were not sure of any connections, particularly to science (3 of 3).

The majority of visiting groups indicated that art and science connections are important in the context of a science museum.

Interviewed groups were asked to rate on a scale of 1 to 5 how meaningful it was for the Museum of Science to have exhibits that combine art and science.⁵ Table 8 shows that a high number of visiting groups for both exhibits responded that it was extremely or very meaningful to have exhibits at the Museum of Science that combine art and science (*Diets* 72.4%, 21 of 29; *Bonsai* 90.6%, 29 of 32). A few other visiting groups found these type of exhibits somewhat meaningful (*Diets* 20.7%, 6 of 29; *Bonsai* 9.4%, 3 of 32).

TABLE 8. How meaningful are Art and Science connections in MOS

	% Extremely Meaningful	% Very Meaningful	% Somewhat Meaningful	% Not Very Meaningful	% Not at all Meaningful
<i>25 Diets</i> (n=29)	41.4%	31.3%	20.7%	6.9%	0.0%
<i>Bonsai</i> (n=32)	59.3%	31.3%	9.4%	0.0%	0.0%

When probed further as to what about combining art and science in exhibits is meaningful to them, the following themes emerged. Just under a third of visitors from both exhibits said that combining art and science helps visitors gain a broader or deeper understanding of how these two disciplines are related (*Diets* 31.0%, 9 of 29; *Bonsai* 31.3%, 10 of 32). Responses to this

⁵ Meaningful Scale: 1= “Extremely meaningful”; 2= “Very meaningful”; 3= “Somewhat meaningful”; 4= “Not very meaningful”; 5= “Not at all meaningful.”

question captured some great insight into how visitors see the relationship between the two disciplines:

“...things are not discrete in how we explore and understand them in the world- the interconnectivity of it.” (25 Diets, Female, 25-29)

“Just that science is a creative process. It’s a bridge between the engineering creativity and art. They’re located in the same area in the brain.” (Bonsai, Male, 34-54)

“To actually see what they’re talking about is two different ways of learning. There are many different ways to learn.” (25 Diets, Male, 45-54)

“Neither is better or a truer representation of human endeavor. They’re both different doors to our intellectual capabilities.” (Bonsai, Female, 55-64)

Other visiting groups offered that connecting art to science provides a new perspective on science and makes science more accessible (*Diets 27.6%*, 8 of 29; *Bonsai 15.6%*, 5 of 32). This perspective suggests that science can sometimes be portrayed as factual, perhaps cold and impersonal information. Connecting art with science can add life and interest to science topics. Visitors who spoke about this theme made comments such as, *“...I can learn more about something I only knew little about. The art helped me apply that...” (Female, 65+)* or *“...people think science is cold, mathematical, but it’s not always. This shows that” (Male, 25-29).*

Visitors from both exhibits found that the art and science connection related to their personal lives (*Diets 27.6%*, 8 of 29; *Bonsai 12.5%*, 4 of 32). Many of these visitors (from both exhibits) connected their experiences to their professions, whether they worked in a more artistic, scientific, or educational field (7 of 12). For example, a visitor from 25 Diets said, *“Personally, I am interested in the art field and now I work in engineering, so it’s kind of connecting both parts of my life” (Male, 18-24)* and a Bonsai visitor said, *“I’ve very interested in art and science. That’s the kind of exhibit I look for. I’m a scientist (radiologist) and I have an artist for a son” (Female, 45-54).* Other visitors emphasized their love for art and art museums (4 of 12) or their interest in the intersection of art and science (4 of 12). It’s not surprising that the percentage of personal connections was higher for 25 Diets since the exhibit presented portraits of real people and their food narrative. Food is an area that most everyone can relate to, whereas bonsai trees may have been a new subject matter for some visitors.

A selection of groups from the *Bonsai* exhibit felt that it was important to combine art and science to gain a broader or deeper understanding of the exhibit content (12.5%, 4 of 32). In this category, visitors were making more specific connections to the *Bonsai* exhibit itself and how it related to nature. Visitors offered comments such as, *“Art and science can come together in a tree” (Male, ~11)* or *“[It] shows the connection between life on Earth’s beauty in its forms. To understand life on earth is to study science” (Male, 65+).*

Visitors also provided additional reasons that did not fit into the above themes as to why combining art and science was meaningful to them (*Diets 20.7%*, 6 of 29; *Bonsai 21.9%*, 7 of 32). In 25 Diets, these comments reiterated the beauty of the photos or offered suggestions for exhibit improvement. In *Bonsai*, these comments discussed an element of the *Bonsai* exhibit or

made a tangential thought about art or science in other Museum areas. Additional information about coding and sample responses from this question can be found in Appendices E and G.

Only two groups (6.9%), both from 25 *Diets*, indicated on the meaningful scale that these exhibits were “not very meaningful” to them. However, additional visitors from both exhibits indicated in their comments that this connection was not meaningful to them (*Diets* 24.1%, 7 of 29; *Bonsai* 3.1%, 1 of 32). Three of these visitors responded that they did not know, while five visitors identified that it was not meaningful or that they were interested in science.

THE ART/SCIENCE GALLERY CAN PROVIDE AN EXPERIENCE THAT IS DIFFERENT FROM WHAT OTHER AREAS OF THE MUSEUM CURRENTLY OFFER.

When asked to talk about how the Art/Science gallery made them feel or how it might be different from other Museum spaces, most groups from both exhibits identified at least one unique characteristic regarding the gallery (95.1%, 58 of 61 total interviewed groups). Only a small percentage of groups were not able to identify one quality that was different from other areas of the Museum (4.9%, 3 of 61 total interviewed groups). From the responses of groups that did discuss how the gallery made them feel, the following similar themes emerged.

The overall feel of the gallery is different from other Museum spaces.

Many visitors from both exhibits commented on how the overall feel of the gallery was different from other spaces in the Museum. Some expressed that the gallery is a quiet and calmer space that often has fewer children. This theme was expressed by 48.3% of visitors in 25 *Diets* (14 of 29) and 71.9% of visitors in *Bonsai* (23 of 32). Visitors described the spaces as “comfortable” (*Male, 18-24*), “really calm, relaxing” (*Male 25-29*) and “...quieter, more adult” (*Female, 25-29*). The percentage in *Bonsai* might be higher due to a heightened sense of atmosphere that some visitors felt in *Bonsai*. Another quality that was identified by nearly half of visitors in both exhibits was that the space was well-designed or more open than other areas of the Museum (*Diets* 51.7%, 15 of 29; *Bonsai* 46.9%, 15 of 32). Visitors commented on characteristics such as its spacious quality, intimate size, and appropriate lighting. A visitor from the *Bonsai* exhibit appreciated how the space “does a good job of grouping an open space so that everything is viewable” (*Male, 18-24*) and a visitor from 25 *Diets* remarked, “it’s good for something like this- the sequential order of calories, of photos” (*Male, 35-44*).⁶ A final characteristic described by interviewed visitors was that the Art/Science gallery space had the feel of an art gallery (*Diets* 17.2%, 5 of 29; *Bonsai* 12.5%, 4 of 32). It’s likely that the more traditional presentation style in 25 *Diets* contributed to its higher percentage. This space was more reminiscent of an art gallery, due to the photos that lined the walls and the limited amount of objects in the center of the gallery. Although the trees were displayed similar to the way sculptures would be shown in a gallery, the “live” aspect of the trees might lessen the association to a typical art gallery experience.

⁶ Additional information regarding coding and sample responses can be found in Appendices E and G.

The gallery is a simple space, particularly due to fewer interactive components and white walls.

Some visitors viewed the gallery space as a simple and less interactive space (*Diets* 24.1%, 7 of 29; *Bonsai* 12.5%, 4 of 32). In 25 *Diets*, these characteristics were mostly viewed as negative. These visitors described the gallery as “*sort of neutral*” (Male, 55-64) or felt that the space “...*looks like a mobile setup [looks like a traveling exhibit]*” (Male). However, one visitor offered a positive perspective by saying that “*It’s less interactive, but I enjoy it because you can take your time. I like to read and I’m a visual learner, so this is good*” (Female, 25-29). Visitors at *Bonsai* expressed similar perspectives. The majority of these visitors offered comments similar to “*I don’t think it does justice to the bonsai. I think it deserves an outdoor space, not these white stark walls*” (Female), but one visitor said that, “[*He liked*] *like the white walls. It’s peaceful to have them blank and the exhibit really stick out*” (Male). It seems that an advantage to the neutral color palette is that it has potential to make the exhibit stand out in the space, but there may be some additional ways to give the space more character.

The Art/Science gallery is always changing, encouraging visitors to return during subsequent Museum visits.

Visitors who had previously visited this space highlighted that the Art/Science gallery is a space that continually changes (*Diets* 20.7%, 6 of 29; *Bonsai* 21.9%, 7 of 32). One visitor from 25 *Diets* offered that, “*I just know this is where I go to see different exhibits. I’ve been here many times*” (Male, 25-29). Another visitor from *Bonsai* commented that, “*Every time we come, there’s a different exhibit, which I like. It’s not an exhibit that costs money. It’s one that’s free.*” These visitors see a benefit in a space that changes and they look forward to returning to the space during subsequent visits. Although it may not be the primary reason for returning to the Museum of Science, it appears that some visitors are aware of and curious about the Art/Science gallery. It is a space that they enjoy.

CHANGES CAN BE MADE TO FURTHER ENHANCE THE VISITOR EXPERIENCE IN THE ART/SCIENCE GALLERY.

While many visitors suggested improvements to the Art/Science Gallery, just over half of visitors to *What I Eat: Around the World in 25 Diets* (55.2%, 16 of 29) and one-fifth of visitors to *Bonsai: Creating Art with Nature* (21.9%, 7 of 32) did not suggest changes to the gallery space or exhibit. For 25 *Diets*, visitors either indicated that they liked the space in its current state or they were not sure what changes would need to be made. These comments also came across in *Bonsai*, but there were a couple of visitors who emphasized that the space “*suits this exhibit*” (Female, 65+) and one visitor compared *Bonsai* to 25 *Diets* by saying, “*Compared to “What I eat”-that is too cluttered, too much information. This setup is good for kids, perfect for her. We were able to read everything in here*” (Male, 45-54). Changes offered in the following section may further account for the difference in these percentages.

Visitor responses regarding changes that could be made in the gallery seemed to suggest that additional links could be made between exhibit design and the content presented in the exhibit. Overall, visitors recommended physical changes to the exhibit space that may enhance the

exhibit on view and their experience in the gallery (*Diets* 41.3%, 12 of 29; *Bonsai* 53.1%, 17 of 32).⁷ The suggestions offered by visitors can be divided into five different types of changes: visual, auditory, tactile, taste, and smell.

For *25 Diets* some visitors suggested visual changes to the room (4 of 12) such as, “*You need colors, some height. It’s very mundane*” (*Female, 25-29*). Other visitors (2 of 12) requested more of “*a 3D look*” (*Female, 35-44*). Most likely due to the exhibit subject matter, four respondents suggested, “*maybe providing some food.*” Three visitors requested a tactile change to increase interactivity in the gallery. Of the timed and tracked groups, only 16.7% (5 of 30) interacted with the activities in the center of the gallery. Visitors sometimes expressed that they were either not aware of or not interested in the activities in the center of the gallery, suggesting that an alternative could be having “*plastic food, maybe you could make your own calorie count*” (*Female, 45-54*). Other suggestions included spoken text (1 of 12) or smelling spices (1 of 12). The visual changes mainly addressed the room or exhibit space, while the other changes were more directly related to the exhibit content. In general, visitors wanted a more multisensory experience with the *25 Diets* exhibit. Additional information about coding and responses can be found in Appendix E.

For *Bonsai*, visitors offered some of the same multi-sensory changes as *25 Diets*, but some people suggested more all-encompassing comments that called for ways to transform the space into a more comfortable and Zen-like atmosphere (7 of 17). Visitors wanted to take in more of the *Bonsai* setting by creating a space that embodied the same feel as the exhibit. Visitors gave descriptive comments such as, “*Making it feel more like a garden...*” (*Female, 35-44*), “*...bamboo flooring or like a stone path where you could feel the crunching stones...*” (*Female, 45-54*) and “*...quiet signs...*” (*Male, 65+*). The visual changes suggested (7 of 17) supported this heightened sense of atmosphere but they also involved changes that could be made to the room itself, such as, “*I understand the black. Maybe some better lighting for the plants so you wouldn’t have to look at the stark walls*” (*Female, 45-54*). *Bonsai* visitors also called for auditory changes (5 of 17) such as, “*Shut the doors. Add Japanese music. [Or at least] some music...*” (*Male*). Other visitors suggested adding a hands-on component (2 of 17) or “*...subtle aromas like woodchips or something*” (*Female, 45-45*). Overall, visitors wanted the room to appear more authentic and reflect more of the feeling created by the exhibit. Although the detail of their comments were about the *Bonsai* exhibit, the idea of making the room match the exhibit look and feel can be adapted to future Art/Science exhibits. Additional information regarding coding and responses can be found in Appendix G.

Visitors from both exhibits made comments about material specific to the gallery exhibits (*Diets* 17.2%, 5 of 29; *Bonsai* 18.8%, 6 of 32). For *25 Diets*, visitors were looking for additional content (3 of 5), such as more personal information about the people in the photos, information about how the people exercise, and a calorie average for each country. Out of the six *Bonsai* groups, four visitors wanted more live trees in the room, one wanted to see a video of someone illustrating the techniques and another wanted lectures or demonstrations regarding the process. Two visitors from *25 Diets* commented that any suggested changes would “*...depend on the exhibit that’s in here*” (*Female, 25-29*).

⁷ Some groups offered more than one type of change, so group comments may have been split to better capture their full response.

IV. CONCLUSION

This comparative study analyzed two exhibits in the Art/Science gallery, *What I Eat: Around the World in 25 Diets* and *Bonsai: Creating Art with Nature*, in order to better understand how visitors interacted with these exhibits, the Art/Science gallery space and any connections they may have made to art and science. The following themes emerged regarding the Art/Science gallery:

- Visitors to this gallery may differ from the overall Museum audience. This gallery is likely to attract specific Museum segments, such as experience-driven adult duos and sightseeing families. These groups are likely to consist of an older audience and are unlikely to have a Museum membership.
- Format, content, and artifacts have an effect on visitor interactions in the gallery. These aspects may accentuate different exhibit strengths. *Bonsai* was the most visited exhibit in the Art/Science to date (43.1%), however visitor dwell time was an average of 4.1 minutes. *25 Diets* had a longer average dwell time than expected (15.8 minutes), but visitation was lower (26.2%) and closely mirrored earlier Art/Science exhibits.
- All visiting groups were interested in the exhibit on view, particularly the exhibit content. A higher percentage of *Bonsai* visitors (65.6%) did indicate that they were interested and would visit again. The rotation of trees in the exhibit may have contributed to this willingness to return.
- The Art/Science gallery is a space where visitors can understand and appreciate art and science connections. Over half of interviewed groups from both exhibits were able to articulate both art and science connections (*Diets* 58.6%; *Bonsai* 56.3%). Having art in a science museum was meaningful to most visiting groups because these exhibits can provide a broader/deeper understanding of how these exhibits are related, provide a new perspective on science, or connect to visitors on a personal level.
- The Art/Science gallery can provide an experience that is different from what other areas of the Museum currently offer. Visitors were mostly positive about the gallery, responding that the overall feel of the gallery, more simplistic space, and rotating exhibitions created a different atmosphere than other Museum spaces.
- Changes can be made to further enhance the visitor experience in the gallery. In general, visitors recommended changes that drew stronger connections between the exhibit design and the exhibit content. These changes were often multisensory changes that enhanced the exhibit on view.

All of these themes indicate that the Art/Science gallery and their exhibits are valuable to the audience who visit this space. This audience may not be coming exclusively to view exhibits in this gallery, but their experience at the Museum is more meaningful because of what this gallery has to offer.

REFERENCES

Lindgren-Streicher, A., Cahill, C., Colligan, A., & Reich, C. (2011). *Visitor experience monitoring project: Fiscal year 2011 report* (Research report No. 2011-10). Museum of Science, Boston, MA.

APPENDIX A: WHAT I EAT: AROUND THE WORLD IN 25 DIETS INSTRUMENTS

Time and Tracking:

Visitor Information
Adult F ____ # Adult M ____ # Child F ____ # Child M ____ Group was: Cued Uncued
Group type: <input type="checkbox"/> Kids only <input type="checkbox"/> Adults only <input type="checkbox"/> Adults and kids <input type="checkbox"/> Other: _____

Visitor Tracked: _____ **Total Time Spend in Gallery:** _____

Observed Behaviors in *Around the World in 25 Diets*:

	# photos visited (at least 2 seconds)	# photos read (at least 5 seconds)	# photos pointed/gestured
Tally Marks <i>[Left wall- 7 photos Back wall- 7 photos Right Wall- 11 photos]</i>			

- Visitor reads the exhibit introduction text
- Visitor reads the art/science connection text
- Visitor reads the artist statement
- Visitor looks at the wall map

(Might have to note this toward the end of the observation)

- Visitor primarily walks around the gallery on his/her own
- Visitor primarily walks around the gallery with a partner
- Visitor primarily walks around the gallery with a group of 3 or more
- Visitor starts off walking with others and later splits off individually

- Visitor converses with others about the exhibit
- Visitor interacts with the table-top activities

Time spent: _____ to _____

- Visitor looks at the *25 Diets* book
- Time spent: _____ to _____

- Visitor sits in the provided seating

Notes (where conversation in the gallery happens/additional behaviors).

Exit Interview:

1) On the scale of 1 to 4, how interesting did you find this exhibit?

[Show visitor scale on back of clipboard and circle answer.]

- 1) I was so interested that I'd visit again. 3) I wasn't really interested.
2) I was interested, but I wouldn't visit again. 4) I didn't find it interesting at all.

[If visitor answered 1 or 2] **Probe:** What did you find to be most interesting about *Around the World in 25 Diets*? **Probe:** Is there anything about this type of exhibit that would encourage you to return?

[If visitor answered 3 or 4] **Why didn't you find *Around the World in 25 Diets* to be interesting?**

2) How does this GALLERY AS A SPACE make you feel?

Probe: How is this GALLERY SPACE different, if at all, from other areas of the Museum?

3) Thinking specifically about *Around the World in 25 Diets*, in what way, if at all, do you think this exhibit connects science with art?

4) On a scale of 1 to 5, how meaningful is it to you that the Museum of Science has exhibits combining science and art, such as *Around the World in 25 Diets*?

[Show visitor scale on back of clipboard and circle answer.]

- 1) Extremely meaningful 2) Very meaningful 3) Somewhat meaningful
4) Not very meaningful 5) Not at all meaningful

Probe: What about combining science and art in exhibits is meaningful to you [or not meaningful to you]?

5) Is there anything about this GALLERY SPACE that would encourage you to return?

6) What changes can be made to this GALLERY SPACE to enhance your experience?

Thank you for helping us out today. Please fill out the basic demographic information on the back [Give "I Helped" sticker].

Please tell us a little about yourself....

1) Please tell us about your group today (including yourself):

Number of adult females: _____

Number of adult males: _____

Number of female children (under 18): _____

Number of male children (under 18): _____

2) Prior to your most recent visit, when was the last time you visited the Museum of Science?

- Within the past three months
- 3-6 months
- 6 months to within the last year
- 1-2 years ago
- 2-5 years ago
- 5-10 years ago
- More than 10 years ago
- Never
- Not sure

3) Are you a Museum of Science member?

- Yes
- No

4) What is your gender?

- Female
- Male

5) What is your age range?

- Under 18
- 18-24
- 25-29
- 30-34
- 35-44
- 45-54
- 55-64
- 65+

APPENDIX B: *BONSAI: CREATING ART WITH NATURE INSTRUMENTS*

Time and Tracking:

Visitor Information	
# Adult F ___ # Adult M ___ # Child F ___ # Child M ___	Group was: Cued Uncued
Group type: <input type="checkbox"/> Kids only <input type="checkbox"/> Adults only <input type="checkbox"/> Adults and kids <input type="checkbox"/> Other: _____	

Visitor Tracked: _____ Total Time Spend in Gallery: _____

Observed Behaviors in *Bonsai: Creating Art from Nature*:

	# trees visited (at least 2 seconds)	# trees pointed/gestured
Tally Marks		

V R (*Text panels visited and/or read*)

-- Exhibit introduction text

-- Why art at MOS?

-- Artist statement

Trees in Nature

Beginnings of Bonsai in China

Japanese Bonsai

Bonsai around the world

Three Bonsai over time

-- The Trees

Art and style of Bonsai

Tools and techniques

Visitor converses with others about the exhibit

Visitor sits in the provided seating

(Might have to note this toward the end of the observation)

Visitor primarily walks around the gallery on his/her own

Visitor primarily walks around the gallery with a partner

Visitor primarily walks around the gallery with a group of 3 or more

Visitor starts off walking with others and later splits off individually

Notes (where conversation in the gallery happens/additional behaviors)

Exit Interview:

1) **How did you decide to visit this gallery today? [Probe: Were you aware of the exhibit or gallery before visiting?]**

2) **On the scale of 1 to 4, how interesting did you find this exhibit?**

[Show visitor scale on back of clipboard and circle answer.]

- 1) I was so interested that I'd visit again. 3) I wasn't really interested.
2) I was interested, but I wouldn't visit again. 4) I didn't find it interesting at all.

[If visitor answered 1 or 2] **Probe: What did you find to be most interesting about *Bonsai: Creating Art with Nature*? Probe: Is there anything about this type of exhibit that would encourage you to return?**

[If visitor answered 3 or 4] **Why didn't you find *Bonsai: Creating Art with Nature* to be interesting?**

3) **How does this GALLERY AS A SPACE make you feel?**

Probe: How is this GALLERY SPACE different, if at all, from other areas of the Museum?

4) **Thinking specifically about *Bonsai: Creating Art with Nature*, in what way, if at all, do you think this exhibit connects science with art?**

5) **On a scale of 1 to 5, how meaningful is it to you that the Museum of Science has exhibits combining science and art, such as *Bonsai: Creating Art with Nature*?**

[Show visitor scale on back of clipboard and circle answer.]

- 2) Extremely meaningful 2) Very meaningful 3) Somewhat meaningful
4) Not very meaningful 5) Not at all meaningful

Probe: What about combining science and art in exhibits is meaningful to you [or not meaningful to you]?

6) **Is there anything about this GALLERY SPACE that would encourage you to return?**

7) **What changes can be made to this GALLERY SPACE to enhance your experience?**

Thank you for helping us out today. Please fill out the basic demographic information on the back [Give "I Helped" sticker].

Please tell us a little about yourself....

6) Please tell us about your group today (including yourself):

Number of adult females: _____

Number of adult males: _____

Number of female children (under 18): _____

Number of male children (under 18): _____

7) Prior to your most recent visit, when was the last time you visited the Museum of Science?

Within the past three months

3-6 months

6 months to within the last year

1-2 years ago

2-5 years ago

5-10 years ago

More than 10 years ago

Never

Not sure

8) Are you a Museum of Science member?

Yes

No

9) What is your gender?

Female

Male

10) What is your age range?

Under 18

18-24

25-29

30-34

35-44

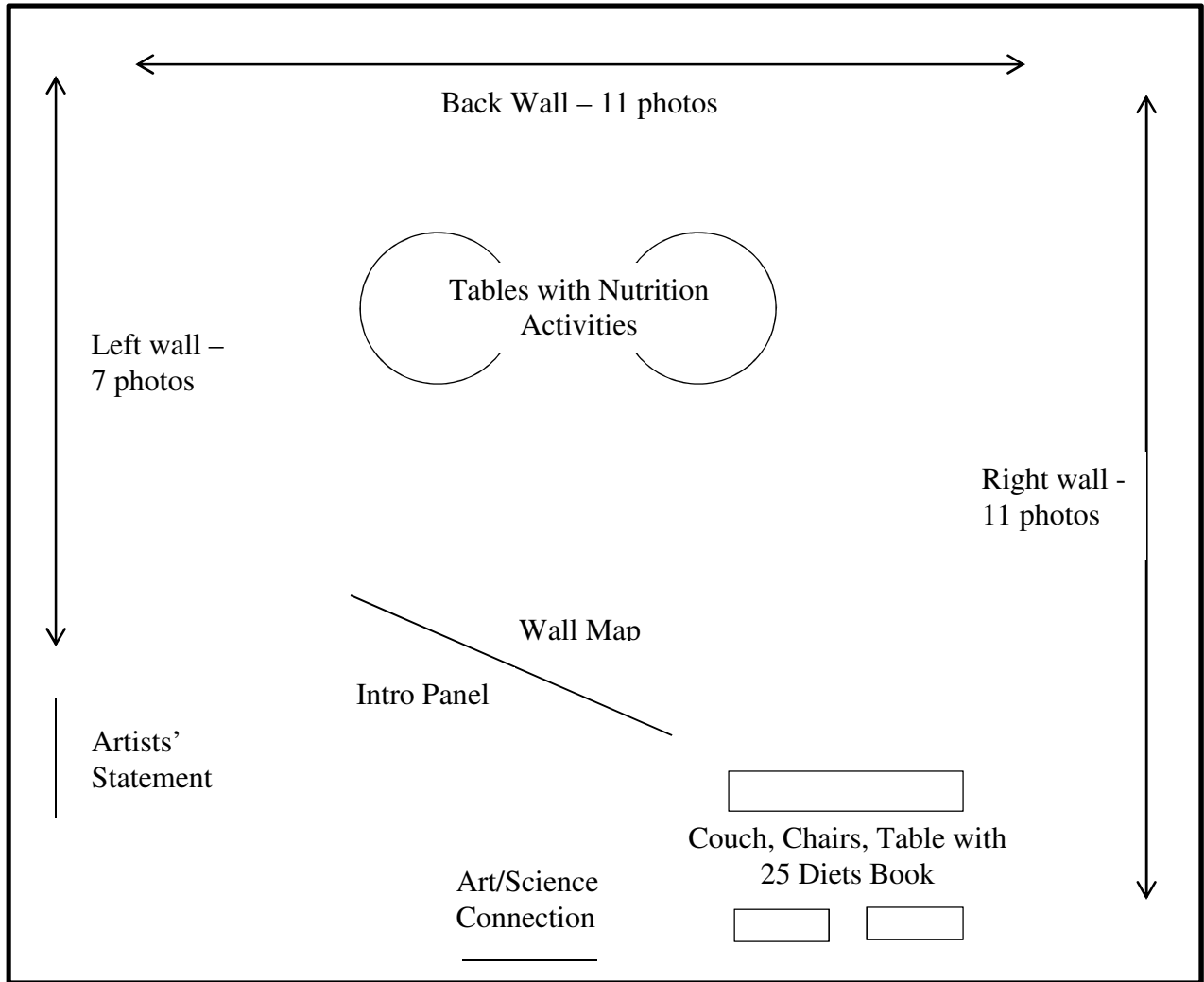
45-54

55-64

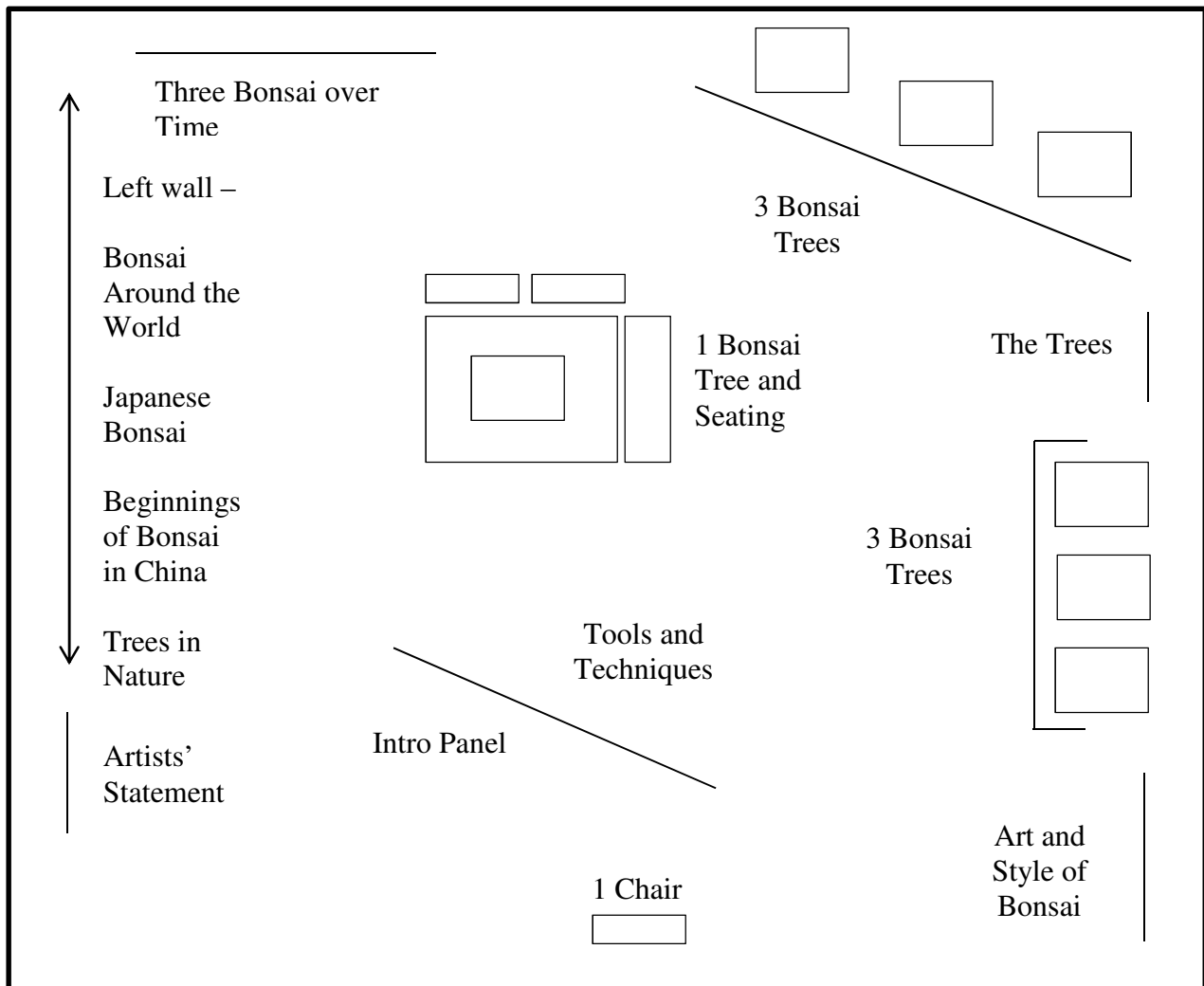
65+

APPENDIX C: FLOOR PLANS

What I Eat: Around the World in 25 Diets Gallery Setup



Bonsai: Creating Art with Nature Setup



**APPENDIX D: WHAT I EAT: AROUND THE WORLD IN 25 DIETS
OBSERVATIONS AND DEMOGRAPHICS**

TRACKED VISITOR DATA		n=30		
Total Time Spent	Mean	15.8 minutes		
	Min	4.3 minutes		
	Max	36.0 minutes		
# Photos Visited (out of 25)	Mean	20.2		
	Min	8		
	Max	25		
# Photos Read (out of 25)	Mean	17.9		
	Min	5		
	Max	25		
		Count	%	
Additional Behaviors	Visitor reads intro text	8	26.7%	
	Visitor reads artist statement	8	26.7%	
	Visitor looks at wall map	4	13.3%	
	Visitor reads art/science connection text	1	3.3%	
	Visitor walks around with partner	13	43.3%	
	Visitor walks around on his/her own	7	23.3%	
	Visitor walks around in group of 3 or more	6	20.0%	
	Visitor walks with others and splits off	3	10.0%	
	Visitor converses with others	19	63.3%	
	Visitor looks at 25 Diets book	4	13.3%	
Visitor sits in provided seating	3	10.0%		
Visitor interacts with table top activities	2	6.7%		

INTERVIEWEE DATA DEMOGRAPHICS		n=29	
Group Size	# Adult females	28	37.3%
	# Adult males	24	32.0%
	# Child female	11	14.7%
	# Child males	12	16.0%
	Total visitors	75	100%
Membership	No	18	62.1%
	Yes	11	37.9%
Visitation	Within past 3 months	4	13.8%
	3-6 months	2	6.9%
	6 months to within the last year	5	17.2%
	1-2 years ago	6	20.7%
	2-5 years ago	3	10.3%
	5-10 years ago	3	10.3%
	More than 10 years ago	3	10.3%
	Never	3	10.3%
Age Range	Not sure	0	0.0%
	Under 18	1	3.4%
	18-24	6	20.7%
	25-29	5	17.2%
	30-34	1	3.4%
	35-44	5	17.2%
	45-54	7	24.1%
	55-64	2	6.9%
65+	2	6.9%	

APPENDIX E: WHAT I EAT: AROUND THE WORLD IN 25 DIETS SELECTED RESPONSES

- 1) On the scale of 1 to 4, how interesting did you find this exhibit? [If visitor answered 1 or 2]
Probe: What did you find to be most interesting about *Around the World in 25 Diets*? Probe: Is there anything about this type of exhibit that would encourage you to return?

Code	Sub Code	Selected Response
Content of the exhibit (n=29)	Interested in the difference in calories and diets across individuals. (n=21)	[F1, 18-24]: "The calorie intake of different places and different careers." [M1]: "The career and what they eat versus what they do."
	Interested in looking at food from different parts of the world. (n=10)	[M1, 18-24]: "The different cuisines around the world."
	Interested in the stories from around the world. (n=3)	[F, 18-24]: "The stories under the panel- the way it described everyday life for these people and the food and diet that fits into that."
Experience aspects that would encourage visitors to return (n=10)	The exhibit presentation (n=6)	[M1, 25-29]: "The visual element draws you in."
	Returning if they change the people in the exhibit. (n=2)	[F, 35-44]: "If they changed around the people so it was different (I would be encouraged to return)."
	Other (n=3)	[F2, 25-29]: "I'd come back with someone else to show them the exhibit." [F1, 18-24]: "Yeah, same."
Not likely to return (n=4)	Not likely to return (n=4)	[F1, 45-54]: "No [nothing would encourage me to return], but it was nice to see."

- 2) How does this GALLERY AS A SPACE make you feel?
Probe: How is this GALLERY SPACE different, if at all, from other areas of the Museum?

Code	Selected Response
The gallery is a calmer and quieter space with few kids. (n=12)	[F1, 25-29]: "It's quieter, more adult." [M1, 25-29]: "That's a fair assessment."
The gallery is a well-designed open space. (n=9)	[M1, 25-29]: "It's more open, there's less clutter."
The space is simple and colorless. [This space is less interesting than other parts of the Museum.] (n=7)	[M1, 55-64]: "Sort of neutral." [F1, 55-64]: "Barren."
The space has the feel of an art gallery. (n=5)	[F1, 45-54]: "It's more like an art gallery."
This space always changes. (n=4)	[M, 45-54]: "We always hit this gallery. It always changes."
Other (n=3)	[F1, 35-44]: "The space isn't themed. The only thing that sticks out is the exhibit."
This space is not different from other areas of the Museum. (n=4)	[F, 35-44]: "I don't know if it's different."

3) Thinking specifically about *Around the World in 25 Diets*, in what way, if at all, do you think this exhibit connects science with art?

Code	Sub Code	Selected Response
Visitor identifies art and science elements. (n=17)	This exhibit uses art to visually depict science and nutrition. (n=17)	[M1]: "The art is through the images trying to convey the diets. The science is the detailed explanation of what food is presented in the images." [F1, 45-54]: "Easy to compare [what people eat]"
Visitor identifies the science in the exhibit (art is the "given"). (n=7)	The exhibit connects to science because it shows how food intake affects health and the body. (n=7)	[F1, 18-24]: "People's bodies are processing the food and how their bodies change because of what they eat."
Visitor identifies the art in the exhibit (science is the "given"). (n=1)	The exhibit incorporates art. (n=1)	[M1, 25-29]: "The portraits were interesting - artistic." [F1, 25-29]: "And the display. I honestly thought there ought to have been more nutritional information."
Visitor did not make art/science connections. (n=6)	The exhibit makes a connection to culture, rather than art or science. (n=3)	[F1, 45-54]: "Interesting to see pictures of all the different counties and what they eat and do."
	This exhibit did not connect art with science. (n=3)	[F1, 25-29]: "I didn't see any connection - that's not science to me, it's a way of maintaining life."

4) On a scale of 1 to 5, how meaningful is it to you that the Museum of Science has exhibits combining science and art, such as *Around the World in 25 Diets*?

Probe: What about combining science and art in exhibits is meaningful to you [or not meaningful to you]?

Code	Selected Response
It is important to combine art and science to gain a broader/deeper understanding of how these two disciplines are related. (n=9)	[F1, 25-29]: "Everyone learns in different ways. Art reflects life - science is life."
Connecting art to science provides a new perspective on science and makes science more accessible. (n=8)	[M1, 25-29]: "The human element. People think science is cold, mathematical, but it's not always. This shows that."
The connection between art and science is meaningful because it relates to an aspect of the visitor's life (i.e. occupation, interests). (n=8)	[M1, 65+]: "I like to go to art museums. I was trained in art a long time ago, so I enjoy it. I like the tie-in with science, especially at a science museum."
Other (n=6)	[F, 35-44]: "Just makes it more interesting. And the pictures are beautiful."
It's not really meaningful to me. (n=7)	[M1, 45-54]: "No, we're indifferent."

5) Is there anything about this GALLERY SPACE that would encourage you to return?

Code	Sub Code	Selected Response
The nature of the space (n=15)	The gallery is a well-designed open space. (n=10)	[F, 18-24]: "I guess the space itself. Makes it nice and easy to view things."
	The gallery is a calmer and quieter space with few kids. (n=9)	[F1, 18-24]: "That it's less chaotic. Not a lot of children."
	The gallery has seating (n=2)	[F1, 45-54]: "They have tables and couches to take a break. It's not particularly interesting. It's nice to have the seating."
Content of the exhibit (n=10)	I enjoy the content. (n=5)	[M1, 18-24]: "It's not like toys. Informative and interesting."
	The space always changes. (n=5)	[M, 45-54]: "We return for what's in here all the time. It's always interesting."
Not really (n=6)	Not really (n=6)	[M1 and F1, 25-29]: "Not particularly."

6) What changes can be made to this GALLERY SPACE to enhance your experience?

Code	Sub Code	Selected Response
No changes necessary (n=16)	Change nothing/I don't know (n=16)	[M1, 45-54]: "I like the feel it has now."
Change the physical space to engage the senses (n=12)	Incorporate a visual change (n=6)	[F1, 25-29]: "You need colors, some height. It's very mundane."
	Incorporate sense of taste (n=4)	[M, 65+]: "Snacks on the way out!"
	Incorporate a tactile change (n=3)	[M1, 25-29]: "It's a very interactive Museum, and this is so different."
	Incorporate sense of hearing (n=1)	[F2, 30-34]: "Something you could hear. Spoken text."
	Incorporate sense of smell (n=1)	[F, 35-44]: "Maybe smelling with the spices. Something more about the senses - especially with food." [M, 10ish]: "It's very much like the Museum of Fine Arts."
	Other (n=1)	[F1, 60s]: "Look at pictures - more seating opposite the pictures so you can sit and dwell on a picture."
Change exhibit content (n=5)	Change something content specific (n=3)	[M2, under 18]: "For this exhibit, it would help to give an average for each country of calories."
	Depends on what exhibit is in the space (n=2)	[F1, 25-29]: "It depends on the exhibit that's in here."

**APPENDIX F: *BONSAI: CREATING ART WITH NATURE*
OBSERVATIONS AND DEMOGRAPHICS**

TRACKED VISITOR DATA		(n=52)	
Total Time Spent	Mean	4.1 minutes	
	Min	0.45 minutes	
	Max	24.8 minutes	
# Trees Visited (out of 7)	Mean	5.1	
	Min	0	
	Max	7	
# Trees Pointed/Gestured (out of 7)	Mean	1.2	
	Min	0	
	Max	5	
		Count	%
Additional Behaviors	<i>Visitor reads artist statement</i>	19	36.5%
	<i>Visitor reads intro text</i>	14	26.9%
	<i>Visitor reads "Why art at MOS?"</i>	6	11.5%
	<i>Visits "Three Bonsai Over Time"</i>	39	75.0%
	<i>Reads "Three Bonsai Over Time"</i>	37	71.2%
	<i>Visits "Tools and Techniques"</i>	28	53.8%
	<i>Reads "Tools and Techniques"</i>	25	48.1%
	<i>Visits "Japanese Bonsai"</i>	26	50.0%
	<i>Reads "Japanese Bonsai"</i>	20	38.5%
	<i>Visits "Bonsai Around the World"</i>	25	48.1%
	<i>Reads "Bonsai Around the World"</i>	18	34.6%
	<i>Visits "Beginnings of Bonsai in China"</i>	24	46.2%
	<i>Reads "Beginnings of Bonsai in China"</i>	18	34.6%
	<i>Visits "Trees in Nature"</i>	20	38.5%
	<i>Reads "Trees in Nature"</i>	15	28.8%
	<i>Reads "The Trees"</i>	18	34.6%
	<i>Visits "Art and Style of Bonsai"</i>	17	32.7%
	<i>Reads "Art and Style of Bonsai"</i>	17	32.7%
	<i>Visitor walks around on his/her own</i>	17	32.7%
	<i>Visitor walks around in group of 3 or more</i>	17	32.7%
<i>Visitor walks around with partner</i>	13	25.0%	
<i>Visitor walks w/ others and splits off</i>	4	7.7%	
<i>Visitor converses w/ others about the exhibit</i>	37	71.2%	
<i>Visitor sits in provided seating</i>	5	9.6%	

INTERVIEWEE DATA DEMOGRAPHICS		(n=32)	
Group Size	# Adult females	70	38.5%
	# Adult males	45	24.7%
	# Child males	36	19.8%
	# Child females	31	17.0%
	Total visitors	182	100%
Membership	No	21	65.6%
	Yes	11	34.4%
Visitation	Never	10	31.3%
	Within past 3 months	5	15.6%
	3-6 months	4	12.5%
	1-2 years ago	3	9.4%
	5-10 years ago	3	9.4%
	6 months to within the last year	2	6.3%
	2-5 years ago	2	6.3%
	More than 10 years ago	2	6.3%
Not sure	1	3.1%	
Age Range	45-54	12	37.5%
	35-44	7	21.9%
	65+	6	18.8%
	18-24	3	9.4%
	55-64	3	9.4%
	25-29	1	3.1%
	30-34	0	0.0%
	Under 18	0	0.0%

APPENDIX G: *BONSAI: CREATING ART WITH NATURE* SELECTED RESPONSES

- 1) How did you decide to visit this gallery today? [Probe: were you aware of the exhibit or gallery before visiting?]

Code	Selected Response
I was walking by the gallery. (n=18)	[M1, 18-24]: "Just walked by and saw it."
I saw the exhibit signs. (n=6)	[M1, 65+]: "I saw other signs about this exhibit in the Museum."
I noticed it through online sources (website or email). (n=3)	[CM1]: "Saw it on the website."
The exhibit was advertised in City Pass. (n=2)	[M1, 45-54]: "A reader's digest-like book. We got the Boston City Pass and it told us to come here."
Other (n=4)	[F1, 45-54]: "We have seen bonsai before. It's an interesting subject."

- 2) On the scale of 1 to 4, how interesting did you find this exhibit? [*If visitor answered 1 or 2*]
Probe: What did you find to be most interesting about *Bonsai: Creating Art with Nature*?
Probe: Is there anything about this type of exhibit that would encourage you to return?

Code	Sub Code	Selected Response
Content of the exhibit (n=27)	Interested in seeing the trees, either the variety represented or specific species. (n=13)	[F1, 45-54]: "Different types I haven't seen before, like the redwoods." [F1, 45-54]: "Bourgonia (flower tree) is beautiful!"
	Interested in the dedication required and/or age of the trees. (n=11)	[F2, teens]: "How long it takes!" [M1, 45-54]: "Didn't realize how long it takes! Some of these are 60 years old."
	Interested in how the trees are managed what tools are used. (n=10)	[M3]: "How they can make it very small out of something so big."
	Other (n=4)	[M1, 35-44]: "How to pronounce bonsai."
Experience aspects that would encourage visitors to return (n=12)	Returning to see which trees have been replaced. (n=6)	[F1, 45-54]: "We would come again to see the trees change."
	Live exhibit (n=4)	[M1, 65+]: "I like that it's alive."
	The exhibit presentation. (n=3)	[M1, 45-54]: "The information presented is simple and straightforward, so for her it's perfect. It's not cluttered."
	Other (n=4)	[M1, 65+]: "What I would like to see is much more information about making bonsai. How to winterize them."
Not likely to return (n=1)	I do not know. (n=1)	[F1, 55-64]: "I don't know."

3) How does this GALLERY AS A SPACE make you feel?

Probe: How is this GALLERY SPACE different, if at all, from other areas of the Museum?

Code	Selected Response
The gallery is a calmer and quieter space with few kids. (n=23)	[F1, 18-24]: "Relaxed, it's nice to get away from the screaming children." [M1]: "Calm, peaceful."
The gallery is a well-designed open space. (n=7)	[M1, 45-54]: "It's fresh and spacy."
The space is simple and colorless. (n=2)	[F1]: "I don't think it does justice to the bonsai. I think it deserves an outdoor space, not these white stark walls."
This space always changes. (n=2)	[F3, 18]: "I like this gallery in general. It's one of my favorite places."
The space has the feel of an art gallery. (n=1)	[M1, 35-44]: "It's more like an art gallery."
Other (n=5)	[M1, 65+]: "Very much so." (different) [AC]: "How?" [M1, 65+]: "It's real, yet artificial. Keeping in with what trees represent as well."
This space is not different from other areas of the Museum. (n=3)	[F1, 35-44]: "No (it's not different). I don't have a view on that."

4) Thinking specifically about *Bonsai: Creating Art with Nature*, in what way, if at all, do you think this exhibit connects science with art?

Code	Sub Code	Selected Response
Visitor identifies art and science elements. (n=18)	Designing and maintaining the growth of bonsai trees connects to both art and science. (n=16)	[F2]: "Hard question. The trees are scientific, but shaped in an artful way." [F1, 45-54]: "So a person as a scientist acts as an artist on the tree."
	Other (n=2)	[F1, 35-44]: "That's interesting because I think this is the first time I've seen bonsai portrayed as art and science together. The art piece is done quite well - how it's aged and formed."
Visitor identifies the science in the exhibit (art is the "given"). (n=9)	The method of manipulating and controlling growth in nature is scientific. (n=7)	[F1, 55-64]: "Science of making trees smaller." [M1]: "Manipulating. Planned experiment with an expected result. Man manipulating nature."
	This exhibit portrays plant life. (n=2)	[F1, 55-64]: It does, because plant life is botany. So botany.
Visitor identifies the art in the exhibit. (n=1)	The exhibit incorporates art. (n=1)	[F1, 45-54]: "They definitely work. It's living art." [M1, 40s]: "Working with nature. I definitely see the art more than the science."
Visitor did not make art/science connections. (n=3)	This exhibit did not connect art with science. (n=3)	[F1, 35-44]: "If it explained more on how to do it. The redwood one only had the copper wires. I didn't get much science out of it."

5) On a scale of 1 to 5, how meaningful is it to you that the Museum of Science has exhibits combining science and art, such as *Bonsai: Creating art with nature?*

Probe: What about combining science and art in exhibits is meaningful to you [or not meaningful to you]?

Code	Selected Response
It is important to combine art and science to gain a broader/deeper understanding of how these two disciplines are related. (n=10)	[M1, 45-54]: "Just that science is a creative process. It's a bridge between the engineering creativity and art. They're located in the same area in the brain."
Connecting art to science provides a new perspective on science and makes science more accessible. (n=5)	[M1, 25-39]: "Just looks better. Just science can get boring. Presented this way, it's beautiful. More get interested."
It is important to combine art and science to gain a broader/deeper understanding of the exhibit content. (n=4)	[M1, 35-44]: "Both connect. There's some amount of art in science in cultivating these plants. I don't think both can be separate from each other."
The connection between art and science is meaningful because it relates to an aspect of the visitor's life (i.e. occupation, interests). (n=4)	[F1, 45-54]: "I'm very interested in art and science. That's the kind of exhibit I look for. I'm a scientist (radiologist) and I have an artist for a son."
Other (n=7)	[M1]: "What you lacked was an explanation of what bonsai is and how it works - that's the science. Why is there no explanation at the Museum of Science?" [F1, 65+]: "It's interesting."
It's not really meaningful to me. (n=1)	[M1, 35-44]: "I don't know, we love the Museum!"

6) Is there anything about this GALLERY SPACE that would encourage you to return?

Code	Sub Code	Selected Quote
The nature of the space (n=22)	The gallery is a well-designed open space. (n=10)	[M1, 45-54]: "That it's open. It's not a closed space with exhibits on top of each other."
	The gallery is a calmer and quieter space with few kids. (n=10)	[M1, 35-44]: "Yeah, it's nice and peaceful and contemplative."
	Gallery suggestions- mostly specific to the Bonsai exhibit. (n=4)	[F1, 45-54]: "Make it more like a garden-fountains." [M1, 40s]: "The floor - make it earth or carpet, perhaps a path."
	The gallery needs more seating (n=3)	[F1, 45-54]: "Everything. I would like more seating. Even just benches."
	The space is simple and colorless. (n=2)	[M1]: "More trees. I like the white walls. It's peaceful to have them blank and the exhibit really stick out."
Content of the exhibit (n=10)	This space always changes. (n=5)	[M1, 45-54]: "We just like the exhibits that are in here-we've seen several in here."
	I enjoy the content. (n=4)	[M1, 45-54]: "I liked the subject matter."
	Other (n=1)	[F1, 45-54]: "A picture of some of the artists so you could connect with them." [group hadn't looked at the artist's statement yet]
Not really (n=5)	Not really (n=5)	[M1, 10]: "Not really the room."

7) What changes can be made to this GALLERY SPACE to enhance your experience?

Code	Sub Code	Selected Quote
No changes necessary (n=7)	Change nothing/I don't know (n=7)	[F1, 45-54]: "I don't know, I thought it was great for this exhibit."
	Make the space more a more comfortable and Zen-like atmosphere. (n=7)	[M1, 65+]: "Quiet signs." [F1, 65+]: "If the décor was changed a little, maybe people would know (to be quiet). A Japanese garden. Maybe they could take off their shoes!"
Change the physical space to engage the senses (n=17)	Incorporate a visual change (n=7)	[F1, 45-54]: "Different colors on the walls, make it warmer!"
	Incorporate sense of hearing (n=5)	[F1, 45-54]: "Or something that doesn't cost money-- quiet, reflective music-- like Japanese or Chinese flutes."
	Incorporate a tactile change (n=2)	[F1, 55-64]: "A hands on component, so children can learn to make bonsai."
	Incorporate sense of smell (n=1)	[F1, 45-54]: "Some crushed bark that has a scent-- that fresh wood smell... Subtle aromas like woodchips or something."
	Other (n=2)	[M1, 18-24]: "I was just thinking that more space is better."
Change exhibit content (n=6)	Change something content specific (n=6)	[M1, 18-24]: "I like that you have the timeline, but having a video of someone doing a pruning would be helpful and a listing of trees that work well for bonsai and why."

APPENDIX H: MUSEUM OF SCIENCE VISITOR SEGMENTATION

Museum of Science Visitor segmentation

	Motivations	Group composition	Proximity to the Museum	Last visit	Membership	Attraction visitation
Fun-loving families These local visitors come to the Museum to have fun together as a family.	To spend time together as a group/family (54%) and for fun/entertainment for group members/children (38%)	Nearly all groups include adults & children (99%)	Mainly live within 60 miles of the Museum (93%)	Nearly half most recently visited within the past 6 months	Over half are members (56%)	Less likely to visit temporary exhibitions, <i>Human Body Connection</i> , & <i>Theater of Electricity</i> . More likely to go to the <i>Discovery Center</i> .
Education-loving families These dedicated, local families come to the Museum to learn together and have fun.	Educational experience for group members/children (100%), to spend time together as a group/family (64%) and for the fun/entertainment of group members/children (54%). Educational experience for myself (23%) relatively high	Nearly all groups include adults & children (98%)	Mainly live within 60 miles of the Museum (90%)	Over half most recently visited within the past 6 months	Many are members (60%)	Less likely to visit the Omni Theater and <i>RACE</i> , more likely to visit <i>Discovery Center</i>
Sightseeing families These non-local families spend time together at the Museum while visiting Boston.	To spend time together as a group/family (51%) and as something to do while visiting Boston (41%) Also for fun/entertainment (33%) or an educational experience (31%) for group members/children	Most groups include adults & children (75%) Older children in group	All live more than 60 miles away from the Museum.	Most likely to have last visited more than 2 years ago (51%) or to be coming to the Museum for the first time(19%)	Very few members (3%)	More likely to visit many of the permanent and temporary exhibitions; more likely to add-on the <i>Simulator Experience</i>
Experience-driven adult duos These adult pairs visit the Museum largely for a specific experience.	To see a specific exhibit, program, or show (31%) to spend time together as a group/family (33%), and for fun/entertainment for myself (30%)	Nearly all adult-only groups (99%), mainly two people in the group (69%)	Most live within 60 miles of the Museum (82%)	Many last visited between 1 and 10 years ago (43%)	Nearly a quarter of the segment have memberships (24%)	More likely to visit traveling exhibitions (<i>RACE</i> , <i>Inside the Mind of MC Escher</i> , and <i>GW Carver</i>); less likely to visit exhibit halls, <i>Discovery Center</i>