Science Under Sail

Summative Evaluation

for the

Anchorage Museum of History and Art

by

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Introduction

Science Under Sail: Russia's Great Voyages to America 1728-1867 opened in May 2000 at the Anchorage Museum of History and Art (AMHA) for a five-month run. Developed by Curator Barbara Sweetland Smith and designed by Presentation Design Group, *Science Under Sail* was a 5,340-square-foot exhibition consisting of 44 elements, including text and graphic panels, cases with artifacts and specimens, audio stations, ship models, dioramas, and interactive elements. Overhead banners separated the exhibition into five sections:

> Why Did They Sail?, Where Did They Go?, How Did They Get There?, What Did They Find?, and What Is Russia's Legacy?

The purpose of the summative evaluation was to find out how well the exhibition worked. We wanted to know where visitors stopped, what they did, which elements they liked most, how much time they spent, if they understood what the exhibition was about, what they learned, what impressed them, and what suggestions they had for improvements. Since the exhibition was planned to travel, we had the opportunity to make modifications to it between its run in Anchorage and its first travel site.

This report follows other evaluative efforts for *Science Under Sail.* A front-end evaluation, conducted in 1998, queried visitors' prior knowledge of Russian maritime exploration and visitors' expectations for an exhibition on this topic. After the exhibition opened, a critical review was conducted in July 1999 to judge strengths and weaknesses of the displays in anticipation of conducting the summative evaluation.

The contents of this report include descriptions and discussions of the methods and findings of the summative evaluation along with recommendations for changes to make before the exhibition travels.

Methods

Three different strategies were used in the summative evaluation: tracking and timing, interviews, and open-ended questionnaires. (See Appendix A for sample data sheets.) Unobtrusively collected tracking-and-timing data tell us what visitors did; feedback from interviews and questionnaires tells us about visitors' thoughts and feelings and what they can recall about the exhibits. The combined data from these methods produce a well-rounded set of evidence for the degree of success of the exhibition.

For tracking and timing, data collectors unobtrusively observed a random sample of 47 visitors in the exhibition, noting how long they stayed, what routes they took, and where they stopped. For the interviews and questionnaires, data collectors intercepted and recruited (or cued) randomly chosen samples of visitors at the entrance of *Science Under Sail* to participate in the evaluation after they finished looking at the exhibition. Pairs of visitors (23 dyads) were recruited for the interviews, and 56 individuals were recruited for the questionnaires. In summary:

Unobtrusive method--

Tracking and timing (T&T), n = 47

Intercept recruitment, face-to-face methods--

Dyad interviews (DI), n = 23

Cued questionnaire (CQ), n = 56

Demographic data (e.g., gender, age, type of social group) were noted for all three samples. When collecting the intercept data (interviews and questionnaires), we also asked visitors if it was their first visit to AMHA and if they had "any special interest, knowledge, or training in the history of exploration."

For more details and instructions about tracking and timing and the recruitment techniques for the interviews and questionnaire, see the "Methods Workbook" in *Paying Attention: Visitors and Museum Exhibitions* (Serrell 1998). For a list of all the exhibition's elements, see Figure 1.

Findings

The first part of this section summarizes and compares the demographic findings of the three data sample groups (tracking, interviews, and questionnaires). The second and third parts present the results of the unobtrusive and intercept data and, where appropriate, review the results in comparison to exhibition evaluations in *Paying Attention,* which looked at how thoroughly visitors used the exhibitions.

Demographic characteristics of the samples

The samples of visitors included mostly first-time visitors with no special interest, knowledge, or training in the history of maritime exploration. Most people were in groups that did not include children. See Figure 2 for a chart summarizing the demographics.

Data from the dyad interviews were collected on two weekdays (a Wednesday and a Friday) from pairs of adult visitors. In this sample, the vast majority of the people (98%) were first-time visitors to AMHA. Thirty-three percent of them said they had a "special interest": three people were sailing enthusiasts, one person was a cultural anthropologist, and others cited general interests.

Data using the questionnaires were collected on a Monday, a Thursday, and a Saturday. For this sample, the majority (71%) were making their first visit, although the proportion of first-time visitors was not as large as that in the dyad sample. Almost half (45%) said they had a "special interest," including interests in navigation, travel, and family history, as a missionary, from reading books, and from studying or teaching history. Seven percent of the visitors sampled for the questionnaire were in groups that included children; the remainder (93%) were adults-only.

Tracking data were collected all days of the week. Because this method was unobtrusive, we did not ask these visitors if it was their first visit or if they had a special interest. We assume, since the demographic characteristics (majority of first-time, nonspecialists) are fairly typical for many audiences to temporary museum exhibitions, that it was true for the AMHA tracking sample as well. We observed that 13% of the tracking sample were groups that included children.

Spreadsheets of all the demographic data and the tracking data are in the Appendixes.

Findings from unobtrusive observations

We can analyze and summarize the tracking data to see what visitors did in the exhibition by looking at which elements attracted visitors' attention the most and least, and what proportion of the visitors participated in which behaviors.

• **Many elements were attractive to visitors.**

Out of the 44 exhibit elements, the nine most popular elements--where 60% or more of the visitors stopped--were:

"Getting There," the beach diorama, the rocking cabin, the entrance area, the audiovisual map, the sounding activity, the "Science of Navigation" case, "Charting the Pacific," and "Animals."

See Figures 3 and 4 for a full list and chart of the percentage of visitors who stopped at each element.

Twenty-one of the 44 elements were used by more than 50% of the visitors. [1] Forty-one were used by more than 10% of visitors. Compared to other exhibitions, this is very high. In many exhibitions, more than a few elements attract less than 10% of the visitors in a tracking sample.

• **Many visitors used the exhibition thoroughly.**

The average number of stops made by visitors in the tracking sample was 20 (45% of the 44 elements). In many exhibitions, visitors stop at less than one-third of the elements.

In summative tracking data analysis, if a visitor stops at more than one-half of the elements, he or she is referred to as a "diligent visitor" (DV). [2] In *Science Under Sail*, 45% of the visitors were diligent. This is much higher than the average 27% DV. (The highest data in *Paying Attention* is 86% DV.[3])

[1] "Used" means the visitor stopped at the element for 2 to 3 seconds or more.

[2] The average number of stops and the percentage of diligent visitors are not exactly the same. An average is an abstract number that represents a trend of the population. No single visitor may have actually stopped the average number of times. The number and percentage of diligent visitors is an actual count.

[3] One hundred percent DV is possible if a majority moves slowly in single file and stops at the majority of the elements, like visitors might do in crowded, time-ticketed blockbuster exhibitions.

• **Twelve elements were used by less than one-quarter of the visitors (6% to 23% of the visitors).**

Three elements were used by less than 10%: two audio stations and the comment book.[4] Six of the 12 least-used elements were located at the last area of the exhibition. (Refer to Figure 3, and the floor plan in Appendix A.)

• **Visitors read and interacted.**

Visitors appeared to be very engaged with many exhibit elements:

96% percent read something
81% interacted with at least one interactive element
74% read a main panel
30% stayed to watch more than one video segment at the AV map
17% were heard reading out loud to other members of their group

Some of the other behaviors that we noted during the tracking were:

51% talked with a member of their social group
21% picked up a map or self-guided tour
17% read one or more of the English translations of a volume
17% looked up at the sea lion skeleton
9% used the magnifying glass to look at the insects

Of the 10 visitors who picked up an exhibit map or self-guided tour, data collectors noted the following: Most people did not refer to it in the exhibition; one person used it extensively; one visitor put it back on the way out; and one person picked one up on the way out.

See Figure 5 for a complete list and chart of behaviors noted.

• **They spent lots of time.**

Time--how long visitors stay--is one strong indication of visitors' engagement with an exhibition. The average time spent by visitors in *Science Under Sail* was 30 minutes. The longest time spent was 99 minutes (although anecdotal evidence had some visitors

[4] We included the comment book and the credit panel as exhibit elements because they contribute to the visitors' experience.

spending more than two hours). See Figure 6 for bar graphs of the time data and the stops data.

The 30-minute average time spent by visitors in *Science Under Sail* was much higher than usual. Many exhibitions, regardless of the size or topic, have average times of less than 20 minutes.

• **The people who stayed the longest also stopped at the most elements.**
A scattergram of the 47 visitors who were tracked (Figure 7) shows that, in general, there is a positive correlation between time and stops; visitors who spent more time used more elements. The average time (30 minutes) and average number of stops (20) represent the trend for the whole sample, not for any individual in the sample or any "typical visitor."[5]

• **Compared to other exhibitions, *Science Under Sail* had a relatively low sweep rate.**
An objective way to compare the average amount of time spent by visitors in one exhibition with time spent in another of a different size is to calculate the sweep rate index (SRI) by dividing the square footage of the exhibition by the average time spent. In *Science Under Sail* the sweep rate index was 178 (5,340 divided by 30). The lower the SRI, the more time visitors are spending in a given area. In the *Paying Attention* study of 110 exhibitions, the average SRI was 293. *Science Under Sail's* lower SRI is a good indication of visitors' engagement.

Data analysis also showed that *Science Under Sail* was more thoroughly used than most exhibitions, but not exceptionally so. To be "exceptionally thoroughly used" is to have an SRI of under 300 and a %DV (diligent visitors) of over 51%. Only eleven of the 110 exhibitions in the *Paying Attention* study met these criteria.

See Figure 8 for a scattergram of SRI and DV data and where *Science Under Sail* would fit in.[6]

[5] There is no such thing as a typical visitor. Averages and trends are most useful to describe whole samples.
[6] One other temporary exhibition at AMHA has been evaluated using tracking and timing: *Darkened Waters* had an SRI of 205 and 49% DV.

Findings from intercept feedback

In addition to watching what visitors did, we wanted to know what visitors thought of the exhibits. We knew from tracking that they stopped at many elements. In the interviews and questionnaires, visitors told us what they liked, what they did, what they learned, and what they thought. There were many comments about the models, interactives, banners, artifacts, artwork, and audios. Transcriptions of all the interviews and questionnaire feedback are in the Appendixes.

I liked the sound effects. Really liked the ship quarters and the sense of how small it was. Also, the shore camp. I liked anything sensory - sound, sight, touch...especially the skins. And I liked being able to try the navigation instrument. It was really cool. (DI5)

• **They understood what the exhibition was about.**

The main idea the majority of visitors got was about how Russian explorations contributed to our expanded knowledge of natural science.

They said the purpose was to show... *The impact and extent of Russian exploration efforts during the 17th and 18th centuries.* (CQ11) Also, *The history of Russian voyages, the extent of their involvement, interest in geography, plant life, animal life, people, artwork.* (CQ38)

Most of the visitors mentioned the Russians in some way. Among visitors who did not mention Russians by name, there were some who still referred to the explorations in appropriate and specific ways. For example:

The purpose was... to memorialize the history of the area for posterity and to realize the hardships encountered by early explorers. I never realized the fineness of the craftsmanship on the sextants and other equipment. It reminded me that Seward made the correct decision. (CQ6)

The purpose was to show the dedication of man to find a Northwest Passage. What they found was much better than their original intent. They found a new world that we now call Alaska. In spite of small ships, adverse weather conditions and cramped quarters, they accomplished great things. (CQ53)

It was to show the History of Alaska and to make people think and appreciate what early life was like. I had forgotten about the Steller sea cow-- I learned of other naturalists other than Steller. It reminded me that Alaska has a rich and colorful history. (CQ20)

Unlike the tracked sample, the visitors who did the questionnaires and interviews knew they would be talking to a staff person at the exit. Nevertheless, some visitors in the sample were more vague or overly general about the main idea of the exhibition. For example:

It was to show historic voyages by sailors and explorers, how and when and where they traveled and observed and to make people aware of habitation of people, new land and its culture and resources. How little we know of these rough times and voyages made by explorers and adventurers. It reminded me that a lot of people share far and near countries. (CQ30)

It was to show settling of the land, what are the natural resources, historical facts and ways of life and to make people knowledgeable about the explorers and settling of the land, much about Alaska in general, but mainly plant life and wildlife. It reminded me that history is so interesting and exciting. (CQ43)

These answers are not incorrect, but they are not very specific to *Science Under Sail.* These comments could relate to the whole museum, another exhibition in the museum, or be reported (guessed) without actually seeing the exhibition.

Many visitors understood that the Russians collected and recorded a wide variety of information. The most often-mentioned things brought back were natural specimens (plants and animals), human artifacts, and artwork. Also mentioned were maps, navigation information, and water samples.

The newest thing to me was about navigation - how the devices worked. I was stunned by the beauty of the maps. (CQ23)

There were flowers, pictures of animals, animal skins, sketches and paintings of people. I was unaware that they sent along professional painters. It never dawned on me that they would. (CQ5)

Visitors understood that the voyages were important for many reasons, including opening up and expanding new territories, and discovering new species and cultures.

Almost everyone said that they learned something new--often (for 30%) it was the main idea. For example:
I know that Russia had made claim to Alaska and California but had no idea how extensive their exploration had been. (CQ2)

I didn't realize the level of cooperation between countries in the late 18th century in exploration and science. (CQ24)

I didn't know Russia had made such scientific contributions to American natural history. (CQ35)

The foreign names were a challenge to pronounce and recall. Six of the 15 Russian and Native American names in our "key words" list were mentioned specifically.
Bering and some name starting with "L". I'm not good with names, especially foreign names. (DI16)

• **They were impressed by many things.**
Visitors were reminded of the dangers and hardships of life at sea, the need for collaboration in science, and the enduring nature of people's desire to explore. They felt admiration and appreciation for the Russian explorations and believed that the exhibition helped visitors be more aware of, understand, and become excited about the topic.

There is much to learn. Reinforces my desire to have been on one of these early voyages. (CQ12)

I was amazed by the scientific accurateness of the explorers and I enjoyed seeing the plants/animals and peoples they encountered and studied. (CQ44)

I want to know how anyone standing on the deck of a ship in 20 foot swells could find the same place someone else navigating from a deck on 10 foot swells. It's amazing they ever found anything. (CQ46)

• **Most people raved about the exhibition.**
After the question, "Anything else?" on the open-ended questionnaire, 25% of the forms had unsolicited positive comments.

Excellent exhibit -- I liked in particular the organization of the exhibit around a series of questions. (CQ2)

I loved the old maps and atlases. (CQ27)

Great job! (CQ44)

Even when specifically asked in the dyad interviews to make suggestions for improvements to the exhibition, most visitors only made positive remarks. [7]

The vast majority of comments in the comment book were also positive. Many comments were directed specifically at the guest curator, Barbara Sweetland Smith, by name. That the comment book was directly next to the credit panel with the curator's name may help account for the specific compliment.

• **A few people did have suggestions for improvements.**
Needed modern map of Alaska in the exhibit; hard to relate renderings from antique maps to actual locations in Alaska today, especially since most of the place names on the exhibit maps are in Russian! (DI22)

Would like more about the mechanical parts of sailing, maybe more examples of how a mechanism works or working models. (DI6)

At banner of sea cow there was no explanation (written material) about the animal, or we missed it. How large was the sea cow, in fact? The mural is so large, it demands more explanation. Have to hurry through the exhibit because we are catching a plane. (DI13)

[7] A "courtesy bias" is common among visitors interviewed in museum exhibitions. If visitors are specifically told that the exhibition is not finished yet and there is money and time to make changes, they are more likely to offer recommendations in addition to compliments.

• **Time was an issue for many people. Lighting was a problem for some.**

Not enough time to read all written information; lots of written information. (DI1)

Everything is really displayed and explained well, but have to plan enough time to read it all. We don't have enough time. (DI9)

The exhibit was fine but we were too rushed. We tried to get our husbands to stay to answer questions but they went to the tour upstairs. (DI2)

The small labels are difficult to read. Eye level placement would make that easier. (DI8)

I think the lighting should be brighter, to enable older eyes like mine to see better. (CQ25)

Data collectors made comments about their observations of visitor behavior on the tracking sheets. For example:

Two other female visitors talking loudly - exclaim that they cannot read text, need bifocals and glasses. (TT10)

Visitor carefully read majority of panels, except at end of exhibit--no stopping or glancing at final elements. (TT45)

Bent down at #9 to read labels, kept glasses off, got face close to plexi while bent over. (TT22)

People in a hurry at exit interview. Wanted to make 11 a.m. tour of AK Gallery. Hurried through questions/responses. (DI17)

Data collectors also kept track of how many visitors declined to participate in the questionnaire or the interviews and how many "escaped"--that is, did not return to the evaluation desk to be interviewed. The most common reason for refusing to participate was a lack of time.

See more about suggestions for improvements in the "Recommendations" section below.

Discussion

In this section, questions raised in the preview presentation of the findings from the summative evaluation in Anchorage on October 2, 2000, will be discussed, along with some of the issues encountered in the critical review report.

• Did any of the evaluation results surprise the evaluator?

It is always surprising when visitors spend an average time of more than 20 minutes in an exhibition. That is a relatively infrequently occurrence among special exhibitions that are not fee-based (i.e., require the purchase of a special ticket). Another surprise was that the most often-mentioned "new idea" was, in fact, the exhibition's main idea. In most other evaluations using the same open-ended questionnaire, the new ideas are often very specific things visitors have picked up in a particular part of the exhibition.

• What was the difference between the methods and results for the dyad interviews and the cued questionnaires?

The cued questionnaire is a boilerplate instrument that has been used, with minor modifications, in more than a dozen different kinds of exhibitions (e.g., natural history, cultural history, science centers). It captures visitors' experiences in their own handwriting. The number and completeness of fill-in-the-prompts is an indication of the exhibition's ability to help visitors have meaningful experiences. When the results show that the majority of the visitors who fill out the questionnaire respond to all of the question-prompts and write out complete thoughts (rather than no answer, or one word responses), we assume that more people felt confident about their answers and had meaningful experiences. When visitors leave the questions blank, it usually means they have nothing to say. By using an instrument/method that is commonly used in other museum evaluations, the AMHA's results can be compared to other studies.

The dyad interview method of gathering feedback was done to capture a large quantity of highly specific information about visitors' understanding of the exhibition's content. By recruiting and interviewing pairs of visitors who came to the exhibition as a social group, the "onus of knowing" was shared by two people. We wanted the feedback to be more of a conversation and seem less like a test. In addition, recent museum interpretive theory acknowledges the social aspect of visiting a museum exhibition:

Information is often gathered, shared, and processed between and among members of a social group (between adults together, or adults and children).[8]

• How successful was this new dyad method?
Data collectors noticed that some visitors did not converse--rather, they directed their comments to the interviewer instead of each other. Perhaps the visitors needed more encouragement to discuss the exhibit, and the conversations should have been recorded and transcribed to capture more of each visitor's own words.

• Did first-time visitors use or react to the exhibition differently than those who had been here before, or those with a special interest?
No. The visitors who gave short answers or general responses included people who had visited before and who indicated a special interest.[9]

• Did visitors who were part of a bus tour group spend less time?
We could not always tell if visitors in the tracking sample were part of a bus tour, but we did note if visitors seemed to terminate their visit to *Science Under Sail* early or abruptly. Data collectors recorded this on 13% of the 47 trackings. The most common reason to leave the exhibition, however, appeared to be when a museum tour or movie was announced. Thus, competition for visitors' attention and time comes not only from external factors but from within the museum as well.

• Did *Science Under Sail* try to cover too much information?
The patterns we saw in the tracking-and-timing data suggest that. Visitors spent more time in the first room; they tended to stop less frequently in the areas beyond the beach scene, and several of the least-visited elements were in the last hallway in the exit area.

The so-called exit-gradient behavior by visitors is by no means unique to *Science Under Sail.* Many exhibitions in many museums suffer from this well-documented

[8] See references for "The Social Context: Groups in the Museum" in Falk and Dierking, and *Family Learning in Museums* by Borun, et al.
[9] The two demographic questions of "first visit" and "special interest" can be interpreted in many different ways by visitors and cannot be used, therefore, as diagnostic variables for statistical purposes. The two questions are designed to show that the audience consists of these different groups, by their own definitions.

phenomenon: Elements near the exit get less attention. But that fact does not stop exhibit developers from presenting too much information. If visitors felt less overwhelmed, they would spread out their time and stops more evenly across the whole exhibition.

Conjecture

• Why didn't visitors use the audio stations more?
In an exhibition with lots to look at and lots to read, and where understanding the message demands reading, audio devices are perceived as requiring a large commitment of time. The audios were short (under three minutes) in *Science Under Sail* and did not demand a big chunk of a visitor's time-budget. Yet audio is a harder sell than audiovisual elements--such as the map video--which engage visually and permit visitors to move in and out of the program more easily.

• Would audio tours increase the amount of time visitors spent and number of stops visitors make?
Research has shown that visitors using audio tours spend more time than visitors who do not use them. But there are many variables to consider, e.g., the topic of the exhibition; cost of the audio tour; format (linear or random choice). As an optional choice, a 20-minute audio tour for *Science Under Sail* would be very appealing to visitors who did not want to spend a lot of time reading yet wanted to get an overview of the exhibition in less than 30 minutes. The technology of random-access CDs allows for a fast-track tour with options for layers of more information for visitors who have more time or want more detailed information. Audio tours provide a viable alternative to the visual clutter of long and/or abundant labels and multiple languages. The drawbacks are that audio tour use tends to decrease social-group interactions, such as talking, pointing, calling "come look at this," and reading out loud. Also, audio tours can be expensive to produce professionally.

• Did cueing visitors make them spend more time than uncued visitors?
No. There was not a significant difference between the amount of time spent by the three different samples of visitors in this research. (See Figure 9.) Other research has shown that sometimes there is a significant difference, usually when the tracking shows that the average time spent by uncued visitors is less than 20 minutes. [10]

[10] See Serrell, 2000 in References.

• Were there "streakers," "strollers," and "studiers" as predicted?

These categories, while very catchy, are difficult to define and compare. Referring back to Figure 7, the little cluster of points in the lower left part of the scattergram represent five visitors who stayed less than 10 minutes and looked at fewer than six elements. These people clearly did not use much of what was available. Were they "streakers"? [11] If so, they only made up 10% of the sample. For *Science Under Sail*, "streakers" were originally (and unrealistically) defined as visitors who spent less than 30 minutes. By that definition, that includes 57% of our sample. In many exhibitions, that would define everyone!

The cluster of points in the upper right corner of Figure 7 represents the four people who stayed the longest (more than an hour) and looked at the most elements (at least 35 of 44 elements). They were all adults in adult-only groups. Two were in groups of three; one was in a group of two; one was alone. A female by herself spent by far the longest time (99 minutes). She watched all the videos, listened to most of the audio stations, read lots of labels, including the English translations, backtracked several times, and used the self-guided tour: Was she a "studier"? She sped through the exit area, however, skipping several elements. [12] The couple who made the highest number of stops (38) lingered long enough in the "Legacy" area to stop at most of the elements there.

A more clearly and empirically defined (and less value-laden) way of categorizing visitors in a sample of tracking data is by looking at the percentage of diligent visitors (%DV): those who, for whatever reason (e.g., prior knowledge and interest, social group pressure, intrinsic fascination with the captivating elements), stop and look at more than half of the elements. In *Science Under Sail*, 45% were diligent visitors. (See Figure 10.) At the other end of the scale, five of the nondiligent visitors made very few stops, but they are not dropped from the data sample. Even though their exhibition experience was very brief, they still could have gotten something out of it.

[11] While it didn't happen in our study, a person could conceivably come in and look intently at one exhibit element for five minutes and then leave. Would that be a "streaker" or a "studier"?

[12] She then joined the tour at noon, but we did not time her any more.

• Did visitors alone or in adult groups spend more time than visitors who were with children?
Yes, it seems so. The average time spent by adults with children was 24 minutes compared to 31 minutes for adults-only. The sample size for the A+K group was very small, however.

• How does *Science Under Sail* compare to the most thoroughly used exhibition in the *Paying Attention* study?
The most thoroughly used exhibition (with the lowest SRI and the highest %DV) was "Judith Leyster: A Dutch Master and Her World," a temporary exhibition at the Worcester Art Museum in Massachusetts. While some museum practitioners may suspect that the exceptional rating of this exhibition was due to its highly specific topic and that only the most intentional, dedicated and interested visitors came to see it, the success was also due to the exhibit developer's application of exhibit principles that can result in a thoroughly used exhibition, e.g., a focused topic; large-print labels with content directly related to the objects; a manageable amount of objects or text.

• Did all of the things predicted as problems in the critical review turn out to be true?
No. We did not see any further evidence of visitors picking up the audio station labels in response to the instructions "Lift and listen." Visitors did not ignore the "Exit" sign and enter the second room before looking at the first one.

• When the exhibition travels outside Alaska, will visitors to the exhibition be as interested as they were here?
Certainly part of the appeal of the exhibition is its explanation of the geography of the immediate region. But that can include anywhere around the North Pacific. It would probably not get as strong a response from visitors on the East Coast, since the history of exploration is so different there.

• What should be changed to make *Science Under Sail* better?
This topic is the subject of the next section.

Recommendations

The following recommendations come from discussions with staff and volunteers, from feedback from visitors (what we saw them do and what they told us), and from the evaluator's opinion based on her experience with other exhibition evaluations.

• Strengthen the entry message. The exhibit entrance lacks a focal point in the way of a large title. The current banner on the left of the entry area was rarely read by visitors.

The caption labels for the objects (map, ship model, nautical instrument, artwork) in the entry area should be written to support the main message of the exhibition in order to orient visitors to the entire exhibition, not just to these objects.

• Distinguish the "Why is it so dark?" label from caption labels.

• Add "You are here" information on the maps in area 2. The historic maps show areas and views that are difficult for visitors to interpret without more context. By adding a small map that shows a broader geographic perspective, the exact location of the history map can be pointed out. The small map could be attached to or be part of the caption label for each map. This is especially important at the beginning of the exhibition to help establish the themes.

• The importance of orientation cannot be overstressed. Most visitors have limited time to look at the exhibits. If they know how big the exhibition is (number of rooms) and have an overview of how it is organized and sequenced (names of major areas, recommended flow plan), they can plan their time and attention better.

An exhibit map, in the form of a handout or as a wall graphic, will help orient visitors. A self-guided tour booklet is another interpretive option, beyond orientation, and should look different from a one-page map.

• Post the times for the Alaska Gallery tours near the special exhibits gallery so that visitors can budget their time better.

• Audio and video stations would be more attractive to visitors if seating was provided.

A bench near the map AV and small stools for the audio stations would invite visitors to linger longer.

• Instructions and introductions for the audio stations should look different from the other interpretive labels nearby. Add a title: "Sound Station." Introduce the experience and the topic: "You will hear..." Show an illustration of a person using the wand with the instructions: "Lift to listen, hang up to reset." Put an arrow pointing to where the handset is located. It's a good idea, as you did, to state how long the audio segment lasts.

• Explain how the nautical instruments in the large display case were used through illustrations, a booklet, or a video. Unless you have a lot of prior knowledge about these artifacts, they are a mystery.

• Add a mariner's image near the "Shipboard Life" case to put a human face near the objects these sailors used.

• Each of the interactive activities needs to be identified more clearly. Add titles for bathometer activity, sighting activity, etc.

• Some visitors were not sure if the rocking ship cabin was actual size or a scale model. Rewrite cabin label to emphasize that it is the actual size, although four people didn't sleep there at the same time.

• All interactive devices benefit greatly from formative evaluation during design development. The sighting activity needs formative evaluation to make sure it is easy to use and understand, and the wires need to be made stronger so they don't fray.

• Add interpretation for touchable fur to relate it to the exhibit themes. Have the sign say, "OK to Touch." (Starting with "Please..." is misleading because what usually follows is "don't.")

• Caption labels should be at least 18 point type size, especially in dim light. Experiment with the feasibility of white type on dark-colored backgrounds that match

the case paint. While dark type on a light background is usually recommended, the white paper labels against the dark colors in *Science Under Sail* look busy, dense, and crowded.

• Caption labels need to relate better visually to the objects they describe. The crowded conditions make these relationships a problem.

• Make Catherine the Great's statement panel bigger because her commands are a vital part of the themes.

• Hang the section banners (e.g., What Did They Find?) lower for better visibility and closer to walls to avoid shadows. Add the words "plants," "animals," and "cultures" to the banners to make them more distinctive.

• Move and rearrange the sea cow and sea lion information so they are not confused with each other. Some visitors were not sure if the mural was full-size. The caption label needs to be closer to or on the mural.

• "Russian impressions," which is at the end of the exhibition, is not really part of the "Legacy" theme. Move to where?

• Move the modern map showing Russian place names to be with "Legacy."

• At the end, add a list of all 125 voyages.

• The exhibition is very dense. What could be left out? This is a very difficult question to ask now that the exhibition is made. (Limiting the number of themes and objects should be done during the planning and design phase, not after production.) Elements that did not receive a lot of attention from visitors and that could be dropped from travel sites include (with regrets) the following: the comment book; Japan (two sections); map activity; "Remarkable Places" wall; and the pendulum. Since the subtitle of the exhibition is "Voyages to America," could Japan and Siberia be dropped?

Conclusions

The summative evaluations showed that visitors were, in general, very engaged with the majority of the exhibit elements in *Science Under Sail,* that they understood what the exhibition was about, and that they enjoyed it. There were indications that many visitors did not have enough time to see it all.

Many thanks to the data collectors:
Emily Cook, Jeanne Fiske, Christine Marasigan,
Connie Meehleis, Judy Morris, and Monique Renner.

References

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Falk, John H., and Lynn D. Dierking. 1992. The Museum Experience. Washington, D.C.: Whalesback Books.

Serrell, Beverly. 1998. *Paying Attention: Visitors and Museum Exhibitions*. Washington, D.C.: American Association of Museums.

Serrell, Beverly. 2000. "Does Cueing Visitors Significantly Increase the Amount of Time They Spend in a Museum Exhibition?" *Visitor Studies Today* III, no. 2: 3-6.

Figure 1

Science Under Sail - Exhibit elements

(in order of element # and exhibit flow on the floor plan)

1) Entrance - Why They Set Sail
2) Getting There
3) Audio- Landing in America
4) Audio-visual Map
5) Charting the North Pacific
6) Expeditions to Japan
7) Mariners of Distinction
8) Sounding Activity
9) Science of Navigation
10) Shipboard Life
11) Audio - Argument
12) Cabin
13) Map drawers
14) Bathometer activity
15) Bathometer
16) Sighting Activity
17) Canned food
18) Northeast Passage
19) Southern Exposure
20) What Did They Find Intro
21) Plants
22) Beach
23) Animals
24) Audio - Raven
25) Sea Otter
26) Voznesensky
27) People of Japan
28) People of California
29) People of the Islands
30) Audio - Cultural Encounters
31) Tlingit
32) Sea cow
33) Pendulum
34) Touchables
35) Sea lion skeleton
36) People of the North
37) Legacy
38) Audio - Language
39) Mapping the Pacific
40) Mapping activity
41) Native Heritage
42) Concluding map
43) Comment book
44) Credits

	A	B	C	D	E	F	G
1	Science Under Sail	Demograhic Comparison					Figure 2
2		n=46	n=56	n=47			
3		Dyad Number	CQ Number	T&T Number	Dyad %	CQ%	T&T %
4		Wed, Fri	Mon, Thur, Sat	all days of week			
5	Gender						
6	Male	18	31	22	39 %	55 %	47 %
7	Female	28	25	25	61 %	45 %	53 %
8							
9	Age						
10	Young Adult	2	0	4	4 %	0	9 %
11	Adult	40	45	38	87 %	80 %	81 %
12	Senior	4	10	5	9 %	18 %	11 %
13							
14	Group Type						
15	Adults only	(na)	52	41	(na)	93 %	87 %
16	Adults and kids	(na)	4	6	(na)	7 %	13 %
17							
18	First Visit						
19	Yes	45	40	(na)	98 %	71 %	(na)
20	No	1	16	(na)	2 %	29 %	(na)
21							
22	Special Interest						
23	Yes	15	25	(na)	33 %	45 %	(na)
24	No	31	31	(na)	67 %	55 %	(na)
25							
26							

Science Under Sail

Element number, element name, and percent of visitors who stopped at each element

Figure 3

Elements where more than 50% of visitors stopped:

#	Element	%
2	GetThere	85
22	Beach	83
12	Cabin	81
1	Entrance	81
4	VisMap-AV	79
8	Sounding Act.	70
9	Sci of Nav	68
5	ChartPacific	64
23	Animals	64
29	People Island	57
34	Fur touch	57
6	ExporJap	57
25	Otter	55
7	Mariners	55
14	Batho Act.	55
21	Plants	55
28	People Cal	55
13	MapDrwr	53
19	South Expo	53
16	Sighting Act.	51
10	ShipLife	51

Elements where more than 25% of visitors stopped:

#	Element	%
20	Intro to Find	49
17	Canned	47
18	NE Passage	47
31	Tlingit	47
36	People North	43
33	Pendulum	43
15	Bathom	43
27	People Japan	38
26	Voznensensky	32
32	SeaCow	30
41	Native Herit	28

Elements where less than 25% of visitors stopped:

#	Element	%
3	Landing-Aud	23
30	Cult Encout-Aud.	19
11	Argue-Aud	19
44	Credits	17
37	Legacy	17
40	Map-Act.	15
35	SeaLion	15
42	Conclu Map	11
39	Mapping Pac	11
24	Raven-Aud	9
38	Language-Aud	9
43	CommentBk	6

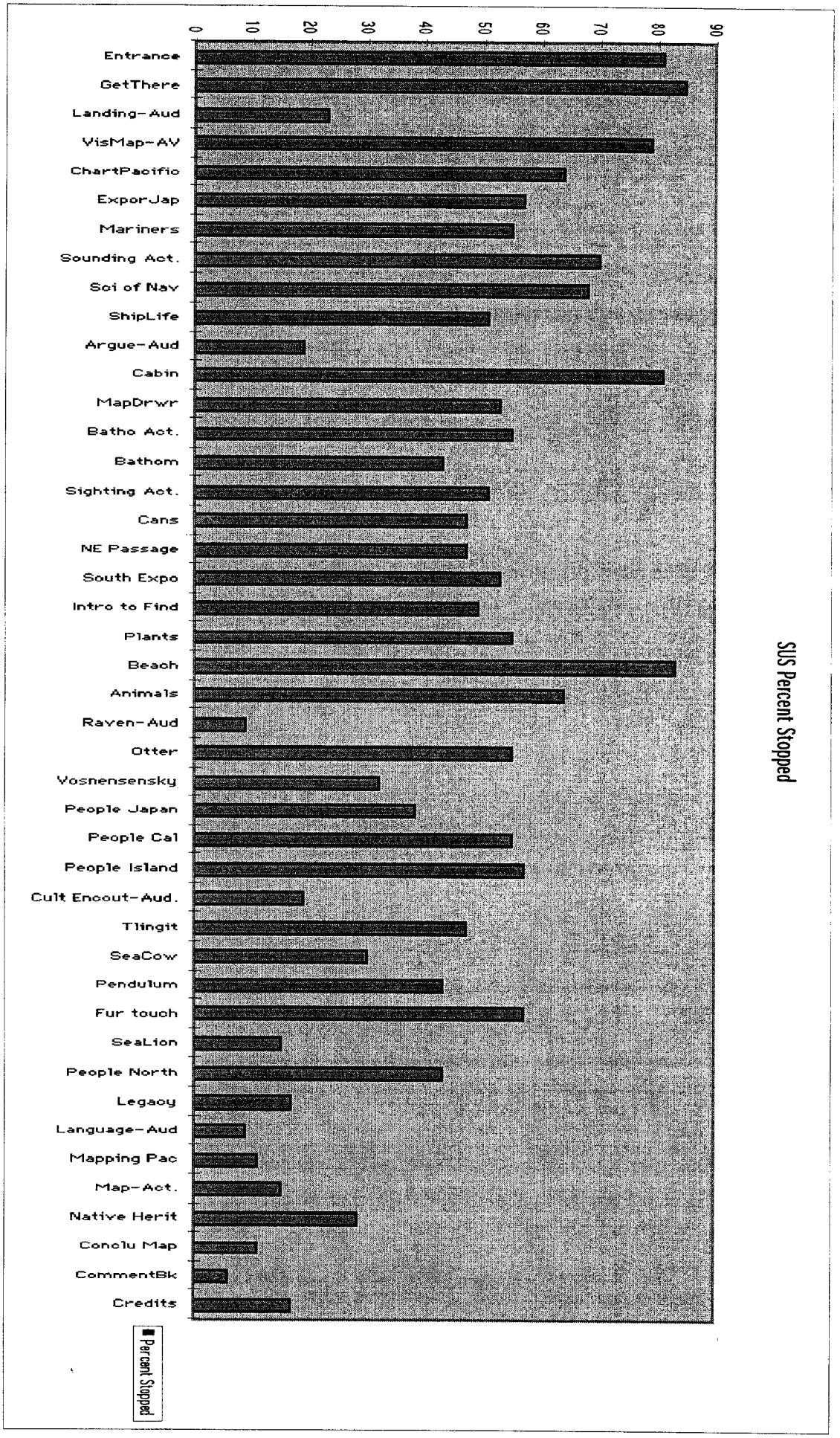

0
10
20
30
40
50
60
70
80
90
Entrance
GetThere
Landing-Aud
VisMap-AV
ChartPacific
ExporJap
Mariners
Sounding Act.
Sci of Nav
ShipLife
Argue-Aud
Cabin
MapDrwr
Batho Act.
Bathom
Sighting Act.
Cans
NE Passage
South Expo
Intro to Find
Plants
Beach
Animals
Raven-Aud
Otter
Vosnensensky
People Japan
People Cal
People Island
Cult Encout-Aud.
Tlingit
SeaCow
Pendulum
Fur touch
SeaLion
People North
Legacy
Language-Aud
Mapping Pac
Map-Act.
Native Herit
Conclu Map
CommentBk
Credits
Percent Stopped
SUS Percent Stopped

Figure 4

	A	B	C	D	E	F
1	Science Under Sail Behavior Summary					Figure 5
2						
3	Behavior	Percent	Number			
4	Read	96%	45			
5	Interact	81%	38			
6	ReadMain	74%	35			
7	Talk	51%	24			
8	(X) look around	45%	21			
9	Read translation	36%	17			
10	More than 1 vide	30%	14			
11	Guide	21%	10			
12	Look up at skele	17%	8			
13	Read outloud	17%	8			
14	CallOver	15%	7			
15	Exit abrubt	13%	6			
16	Mag Glass	9%	4			
17	Lean	9%	4			
18	Entered exit	9%	4			
19	Sit	4%	2			
20	Call Phone	2%	1			
21	Photo	2%	1			
22						
23						
24						
25						

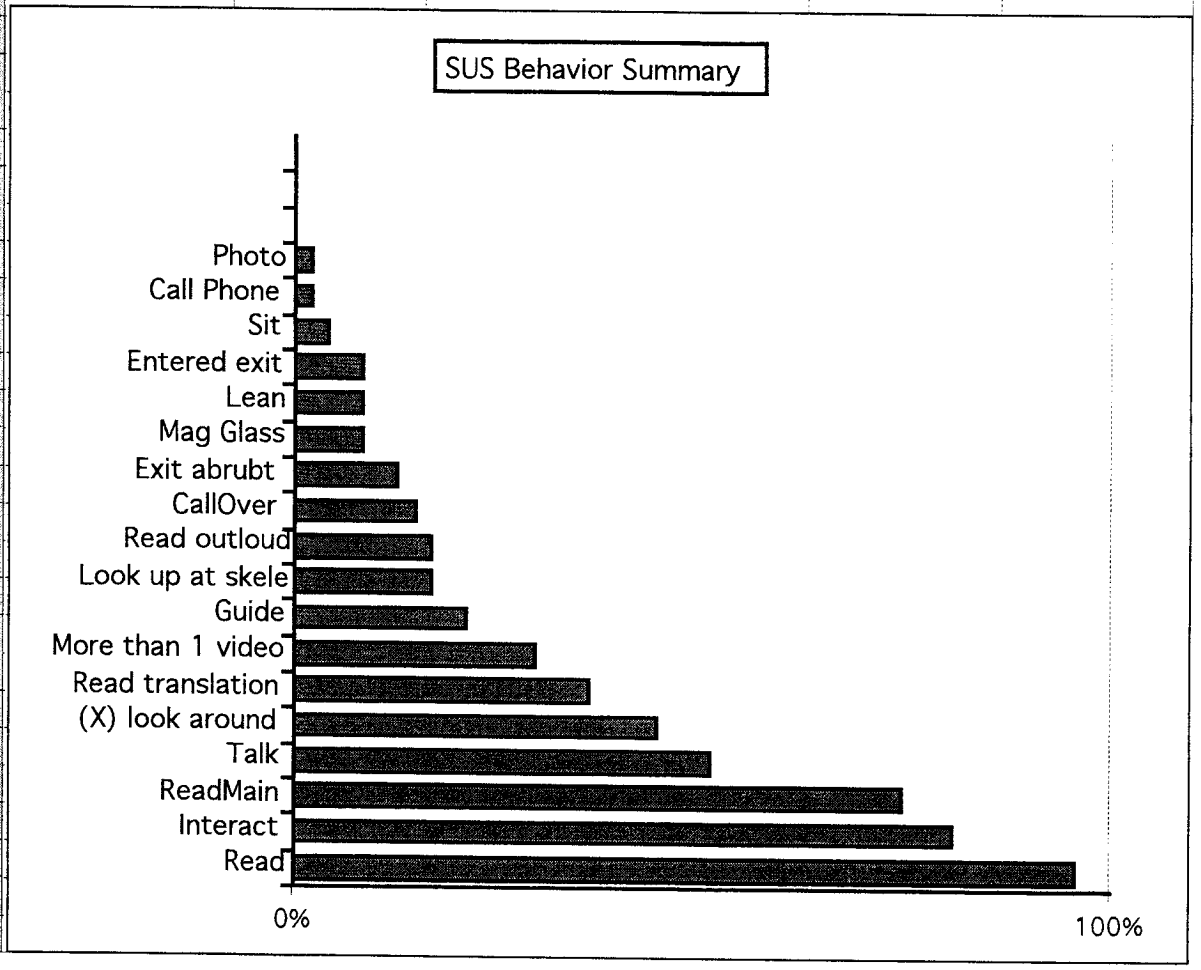
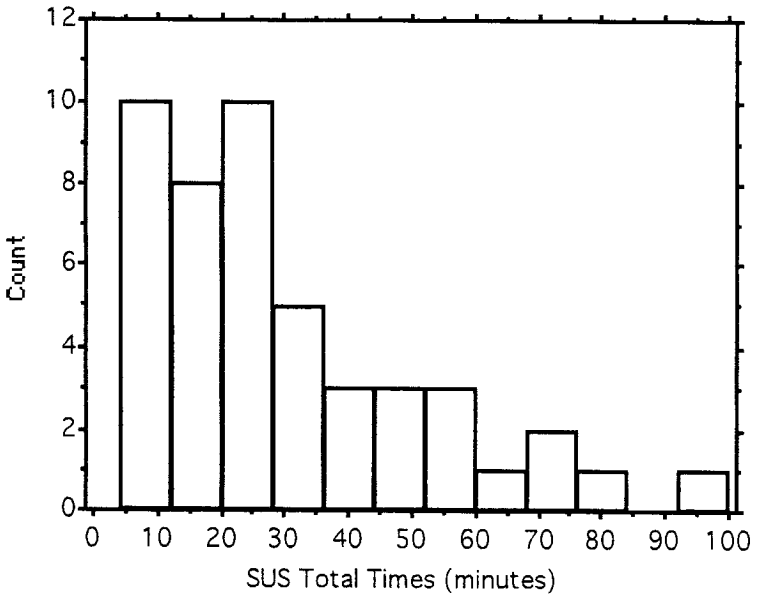


Figure 6

Science Under Sail data for the total time spent by visitors and the number of stops they made in the tracking and timing data. N= 47



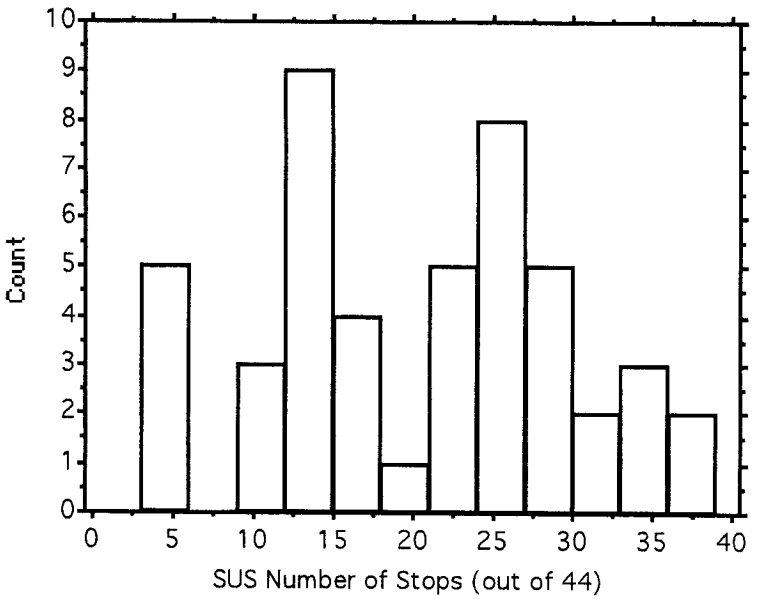


Figure 7

A scattergram of 47 visitors (each dot represents one person) and the total time they spent and the number of elements they stopped at in Science Under Sail.

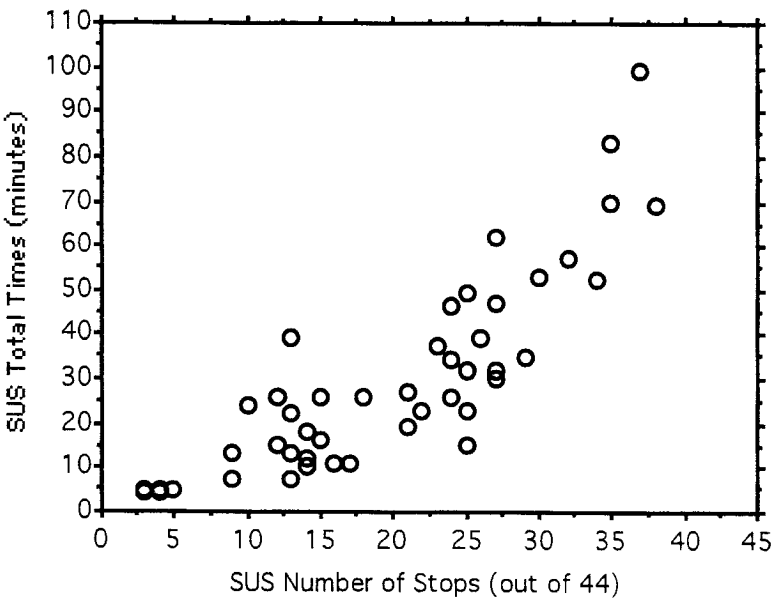
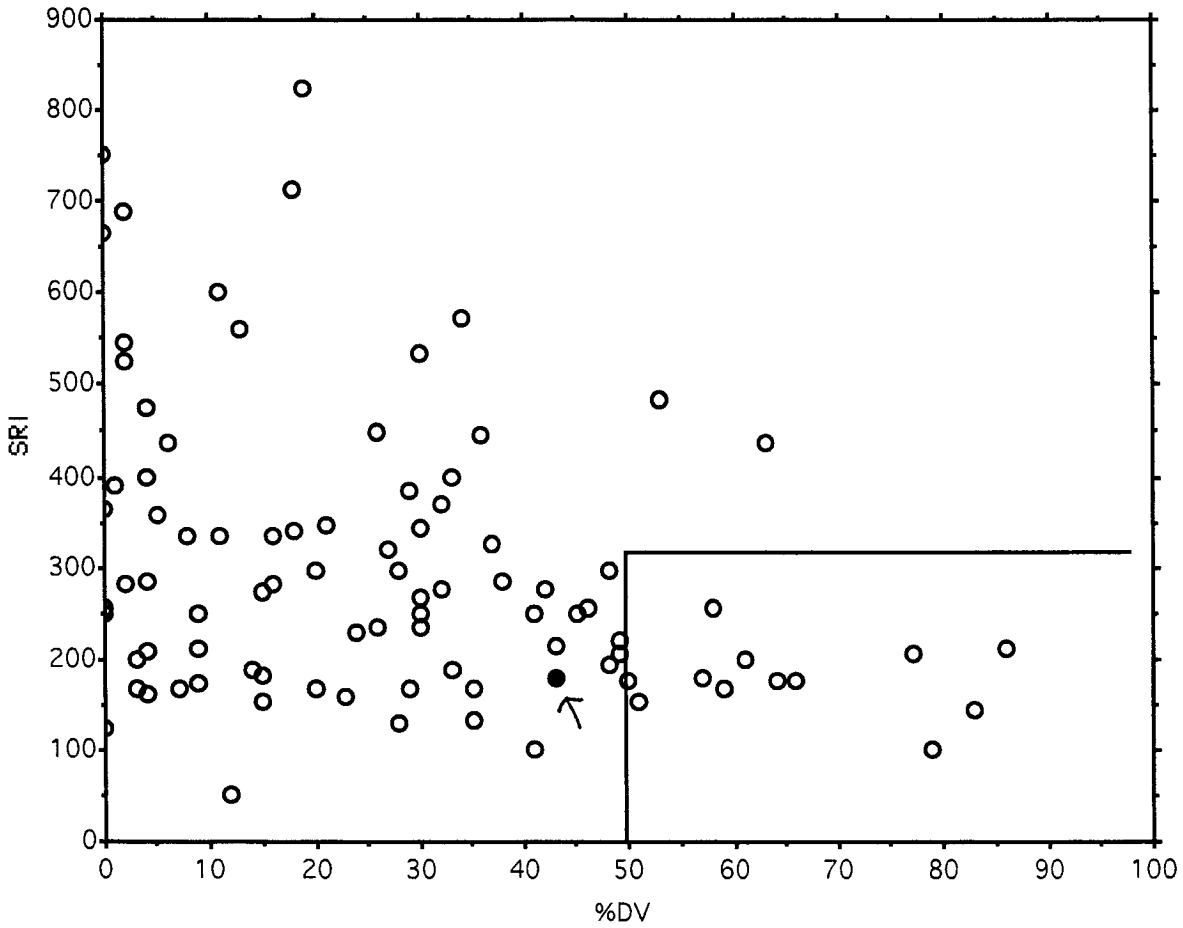


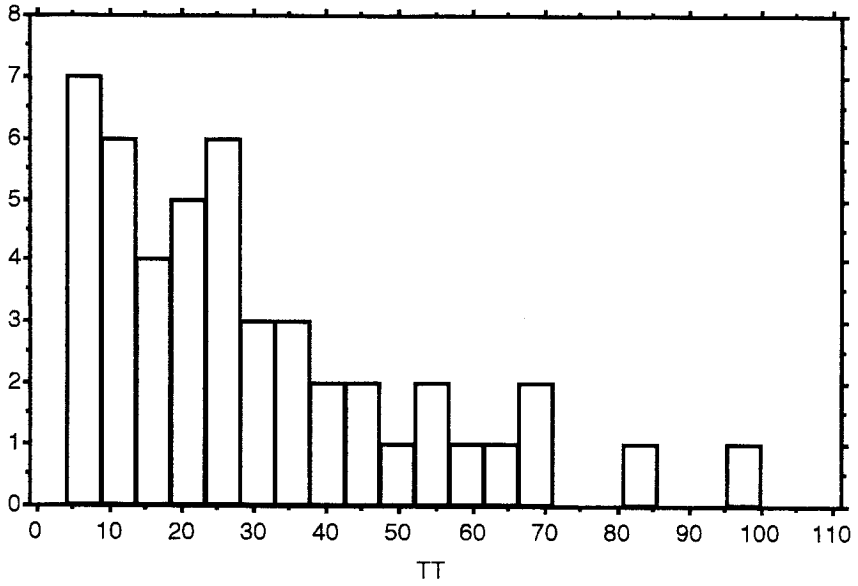
Figure 8

Data from "Paying Attention: Visitors and Museum Exhibitions" Serrell, 1998. AAM.



Each dot represents one exhibition. SRI of less than 300 and %DV more than 50% equals "exceptionally thoroughly used exhibitions." Solid dot = Science Under Sail.

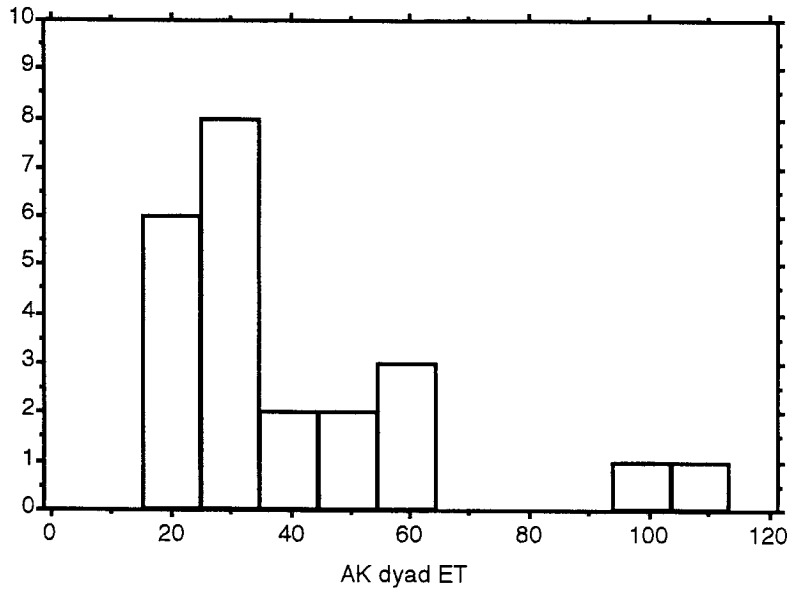
Figure 9



Tracking & Timing

Av.T= 30 min.
Median= 26

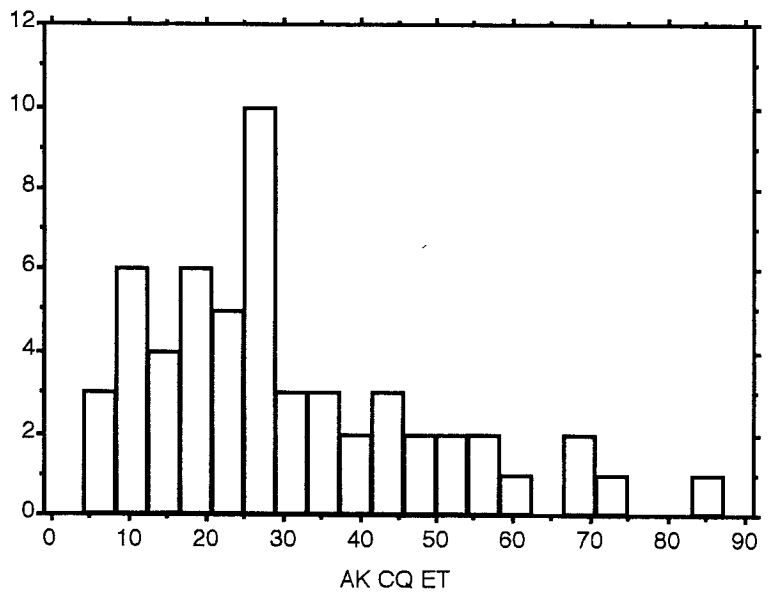
N= 47



Dyad Interviews

Av.T= 39 min.
Median= 33

N= 23



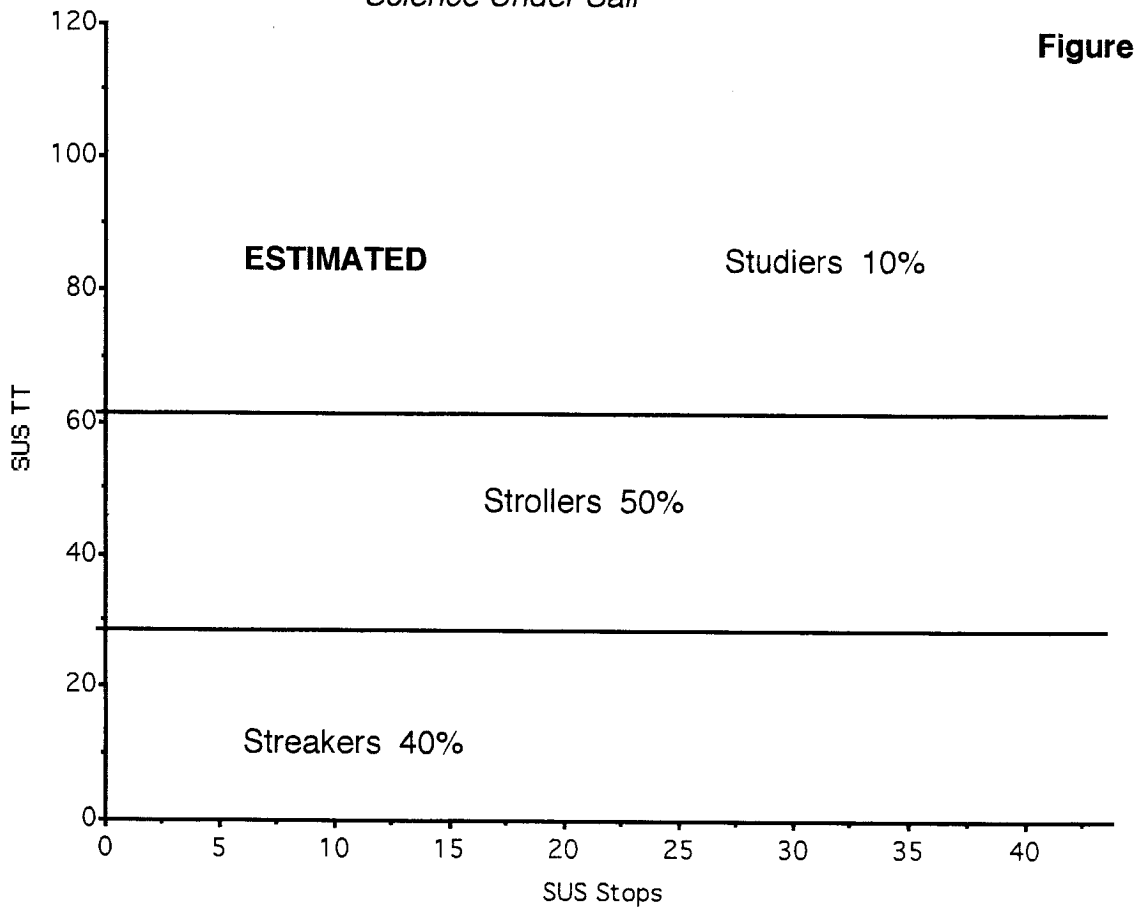
Cued Questionnaire

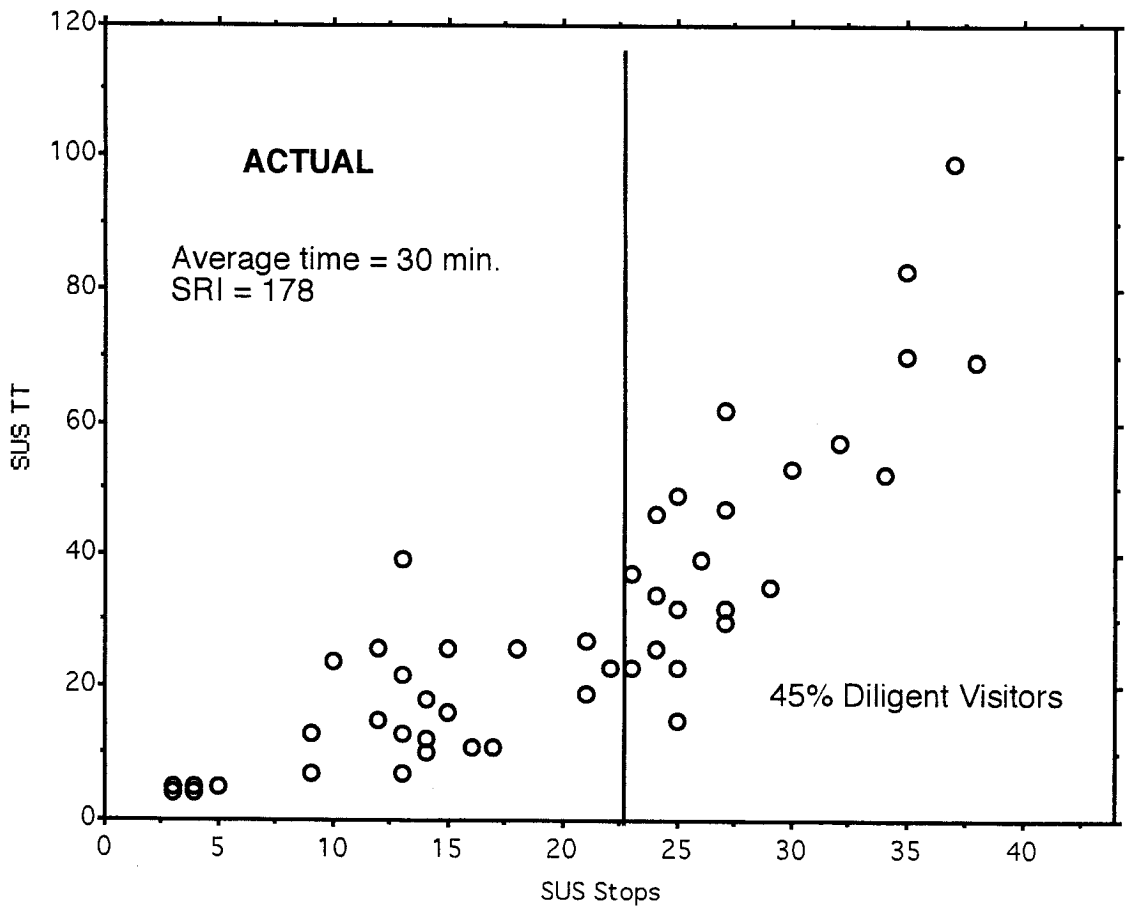
Av.T= 30 min.
Median= 27

N= 56

Total Time Spent
AMHA, SUS, 2 Aug. 00

Figure 10


ESTIMATED
Studiers 10%
Strollers 50%
Streakers 40%
SUS TT
SUS Stops
0
20
40
60
80
100
120
0
5
10
15
20
25
30
35
40


ACTUAL
Average time = 30 min.
SRI = 178
45% Diligent Visitors
SUS TT
SUS Stops
0
20
40
60
80
100
120
0
5
10
15
20
25
30
35
40

Tracking & Timing for "Science under Sail"

Day _____ TOD _____ Date _____ Sheet # _____

Gender: M F

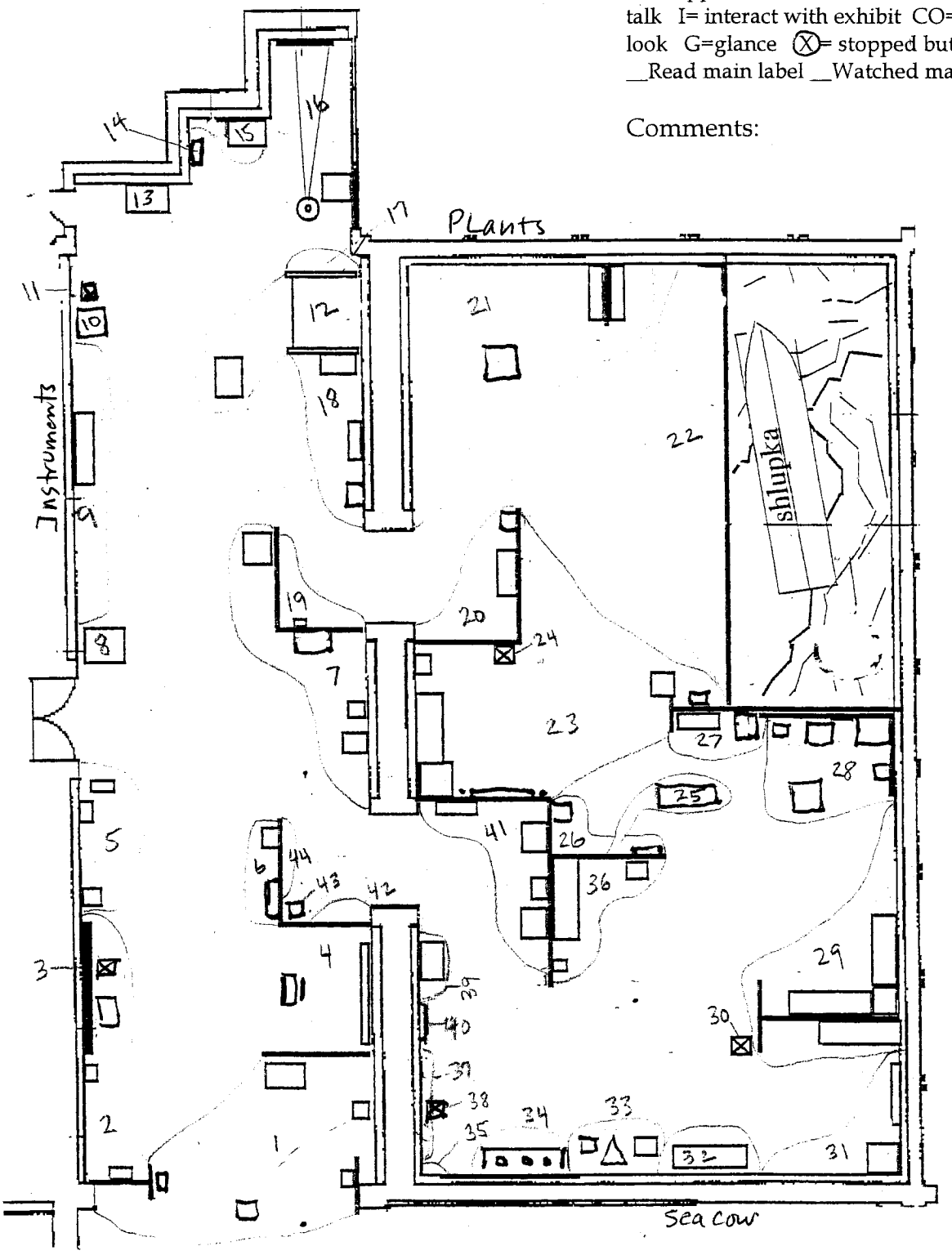
TT _____ Exhibit Stops _____ Age: Young Adults Adults Seniors

Group Size: 1 2 3 4 5+ Group Type: A only A+K

X= stopped R= read ROL= read out loud T= talk I= interact with exhibit CO= call over to look G=glance (X)= stopped but not looking

__Read main label __Watched map video 1 >1

Comments:



data collector _____

Dyad Interview for SUS

Sheet #: _____

Date: _____ Time recruited:_____ Elapsed time_____

A) M F YA A Sr 1st time: Y N SI: Y N
B) M F YA A Sr 1st time: Y N SI: Y N

1. Talk a little about what you saw, did, or found out about in the exhibition.

2. The banners throughout the exhibit say things like, "Why did they sail?" "Where did they go?" "What did they find?" Talk about who "They" were. (Who were some of the key players?)

3. What did they find, what did they collect, or bring back?

4. Why were these Russian-led voyages important? What was the impact on the world?

5. Any comments or suggestions to improve the exhibition?

Data collector_____

Cued Exit Questionnaire for SUS

Date_____ Time_____ Sheet #_____

Sex: M F Age: Young Adult # Group A only
Adult 1 4 A + K
Senior 2 5+
3

Is this your first visit to the Anchorage Museum? No _____ Yes _____
(AMA member?_____)

Do you have any special interest, knowledge or training in the history of science?
No____Yes_____

1. What would you say is the main purpose of the displays in these galleries?
To show...

_____

_____

To make people...

_____

_____

2. What is one new idea you are taking away with you?
I didn't know, or I never realized that...

_____

_____

and/or
It reminded me that...

_____

_____

Anything else? (use other side if necessary)

Data collector _____