

Understanding *Where Next, Columbus?*

**An exhibition study at the
National Air and Space Museum**

INSTITUTIONAL STUDIES



**Smithsonian
Institution**

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An exhibition study at the National Air and Space Museum

Andrew J. Pekarik
David A. Karns
Steven J Smith

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Institutional Studies Office
Smithsonian Institution
900 Jefferson Drive, S.W.
Washington, D.C. 20560-0405
(202) 786-2289

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Abstract

This report presents the results of a study of an exhibition about space exploration in the National Air and Space Museum, called *Where Next, Columbus?* The study was conducted as part of the background research for a new exhibition on the history of cosmology. The study used independent sample surveys at three locations (the museum entrance, the exhibition entrance, and the exhibition exit), supplemented by recorded interviews at four locations inside the exhibition. The results indicated that the exhibition's title and entrance gallery apparently discouraged visitors with a strong interest in spacecraft and spaceflight from entering the exhibition. Inside the exhibition visitors responded very favorably to the Mars landscape room and the Stellarium, the two locations where nearly half of exiting visitors reported that they had their most satisfying experience.

Acknowledgements

We would first like to thank the members of the planning team for the new exhibition on the history of cosmology, David DeVorkin, Curator, History of Astronomy, David Romanowski, Writer and Editor, and Beatrice Mowry, Exhibits Designer, for inviting us to participate in their planning process and for supporting the study of *Where Next, Columbus?* We would also like to thank Valerie Neal, Curator, Space History Division, and the curator of *Where Next, Columbus?* for reading draft versions of the report and offering thoughtful suggestions.

In the Institutional Studies Office, we wish to thank our former colleagues Jean M. Kalata and Stacey Bielick for their work on this study, including the management of survey fieldwork, preliminary preparation of data for analysis, and open-ended interviews with visitors.

We would also like to acknowledge the 651 visitors who responded to our questions and offered additional comments. Without their participation, the study could not have been conducted.

Errors in interpretation are the responsibility of the authors.

Zahava D. Doering, Director
Institutional Studies Office

Table of Contents

Abstract	ii
Acknowledgements	iii
Table of Contents	iv
List of Tables	iv
List of Figures	iv
Background	1
Methods	1
I. The Entrance and Exit Surveys	2
Visitors Entering NASM	2
Visitors Entering the Exhibition	4
Visitors Leaving the Exhibition	7
II. The Exhibition Interview Study	11
Interview Study Results	12
Summary and Implications	16
Questionnaires	18

List of Tables

1. All Anticipated Experiences at NASM	3
2. Most Anticipated Experiences at NASM	4

List of Figures

1. Level of Subject Matter Interest	5
2. Visitor Opinion on "Exploring Mars should be the top priority for America's space program."	6
3. Visitor Opinion on "We should send astronauts to Mars."	7
4. Visitor Opinion on "We should settle on Mars."	7
5. Types of Experiences in <i>Where Next, Columbus?</i>	8
6. Overall Satisfaction by Level of Interest in Astronomy and Spacecraft	9

Background

This study arose out of the efforts of the Institutional Studies Office (ISO) to assist staff at the National Air and Space Museum (NASM) in planning for a new exhibition on the history of cosmology. Although reliable data was available regarding the demographic characteristics of NASM visitors, there was no information about their interests, preferences, or behavior in the museum. In particular, we wondered:

- What kind of experiences do visitors anticipate/enjoy in the museum?
- How many visitors are interested in astronomy?
- What influences visitors to enter a particular exhibition?
- How do visitors respond to designs suggesting exotic environments?

Rather than investigate these issues in a completely abstract, hypothetical way, we decided to focus on an existing NASM exhibition, *Where Next, Columbus?*, an exhibition about space exploration with an emphasis on Mars exploration.

Methods

The study used two different methods. Since we wanted to know the precise distribution of certain characteristics within the museum and exhibition audiences, the primary method used surveys of three different, but equally representative samples—one at the entrance to the museum, one at the entrance to the exhibition, and one at the exit from the exhibition. The survey results were supplemented with semi-structured interviews with visitors at the four locations in the exhibition which had been designed to imitate unusual environments.

Questionnaires

In order to help exhibition planners generally, ISO has been studying the kinds of experiences visitors look forward to when they enter museums or exhibitions and what kinds they recall as satisfying when they leave (Pekarik, Doering, & Karns, 1999). In our studies at various Smithsonian museums we have found that the profile of anticipated and satisfying experiences differs according to the characteristics of the visitors and the features of the museum. In this study, we asked visitors entering NASM and those entering the exhibition to first tell us which of a list of 14 experiences they were looking forward to in the museum or in the exhibition. We then asked them which of these choices they most anticipated, and how strong that anticipation was. Visitors exiting the exhibition were similarly asked to indicate which of the listed experiences they found satisfying in the exhibition, which was most satisfying, and how strong they found that satisfaction. Exiting visitors were also asked where in the exhibition they had especially noticed having that most satisfying experience.

Visitors entering the museum were asked about their feelings on visiting the Smithsonian; visitors entering the exhibition were asked what they thought the exhibition was about; and visitors leaving the exhibition were asked to identify the main idea they came away with. Exiting visitors were also asked how satisfied they were with the exhibition as a whole.

In addition, visitors were asked about their demographic characteristics (including place of residence, age, education, ethnicity), background characteristics (previous visits, subject matter interests), visit characteristics (composition of the visit group, whether they came to see anything in particular or not), and opinions about Mars exploration, the dominant subject of *Where Next, Columbus?*

Data Collection

Between April 12 and May 1, 1999, we surveyed 651 visitors to the National Air and Space Museum: 209 at the entrance to the museum, 220 at the entrance to the exhibition *Where Next, Columbus?* and 222 at the exhibition exit. The overall response rate for the survey study was 84 percent.

In the interview study three ISO staff members recorded interviews with 46 visitors. The average length of an interview was eight minutes.

I: The Entrance and Exit Surveys

Demographics

The visitors in this study represented the typical May audience at NASM. They were predominantly male (59%), with an average age of 38 (s.d.=15.4; median age=38). Just over half were visiting the museum for the first time (53%). About one-quarter of the adults came with children (26%) and another quarter came with one other adult (26%) (34% came in groups and 14% came alone). The majority (68%) live in the U.S. outside of the D.C. area (13% live locally, 18% live outside the U.S.). For visitors over age 25, almost half (46%) have less than a bachelor's degree, 31 percent have a bachelor's degree, and 23 percent have a graduate degree.

Visitors Entering NASM

Anticipated and Satisfying Experiences.

Previous analysis (Pekarik, Doering, & Karns, 1999) has demonstrated that the 14 experiences mentioned by visitors in discussing satisfying experiences in museums can be grouped into four major categories: Object experiences, Cognitive experiences, Introspective experiences and Social experiences. *Object experiences* give prominence to the artifact or the "real thing;" *Cognitive experiences* emphasize the interpretive or intellectual aspects of the experience; *Introspective experiences* focus on the visitor's personal reflections, usually triggered by an object or a setting in the museum; and *Social experiences* center on one or more other people, besides the visitor. The experiences anticipated by NASM visitors are shown in Table 1. On average entering visitors chose 3.3 items.

Table 1
All Anticipated Experiences at NASM
NASM Entrance Only
(In Percent)*

Object experiences

- 42% Seeing "the real thing"
- 39% Seeing rare/uncommon/valuable things
- 17% Being moved by beauty
- 8% Thinking what it would be like to own such things
- 6% Continuing my professional development

Cognitive experiences

- 53% Gaining information or knowledge
- 49% Enriching my understanding

Introspective experiences

- 34% Imagining other times or places
- 12% Recalling my travels/childhood experiences/other memories
- 12% Reflecting on the meaning of what I was looking at
- 6% Feeling a spiritual connection
- 7% Feeling a sense of belonging or connectedness

Social experiences**

- 27% Spending time with friends/family/other people
 - 20% Seeing my children learning new things
-

*Percent total exceeds 100 since visitors could choose more than one experience.

**86% of the visitors came to the museum with at least one other person.

Altogether 68 percent of visitors entering NASM indicated that they were looking forward to at least one Object experience, and 68 percent said that they were looking forward to at least one Cognitive experience. A smaller percentage were looking forward to any Introspective (45%) or Social experience (43%).

When visitors entering NASM were asked to choose, from the experiences they had identified, the one that they were MOST looking forward to in the museum, they gave the responses shown in Table 2.

By comparing Tables 1 and 2 we can see that, although visitors looked forward to many different experiences, they placed their highest priority on Gaining information and Seeing the real thing, followed by Enriching understanding, Spending time with friends, and Seeing children learn.

On average, 31 percent of visitors entering the museum looked forward to their most anticipated experience "very strongly." The strength of anticipation was greatest for those who most looked forward to Seeing their children learn (61% "very strongly").

Table 2
Most Anticipated Experiences at NASM
 NASM Entrance Only
 (In Percent)

32% Object experiences

- 18% Seeing "the real thing"
- 8% Seeing rare/uncommon/valuable things
- 5% Being moved by beauty
- 1% Thinking what it would be like to own such things
- 0% Continuing my professional development

35% Cognitive experiences

- 23% Gaining information or knowledge
- 12% Enriching my understanding

12% Introspective experiences

- 5% Imagining other times or places
- 3% Recalling my travels/childhood experiences/other memories
- 2% Feeling a spiritual connection
- 2% Reflecting on the meaning of what I was looking at
- 0% Feeling a sense of belonging or connectedness

22% Social experiences*

- 11% Spending time with friends/family/other people
 - 11% Seeing my children learning new things
-

*86% of the visitors came to the museum with at least one other person.

Visitors Entering the Exhibition

Most visitors who enter NASM will not be able to see everything in the museum on a single visit. They must make choices about what they will see and what they will pass by. It is important for planners to understand what leads people to enter a particular exhibition. We hypothesized that this decision might be influenced by the kind of experience that visitors were most looking forward to. If that hypothesis were correct, the distribution of anticipated experiences for those entering the exhibition would be different than for those entering the museum, but in the case of *Where Next, Columbus?* we found that the kinds of experiences that visitors most anticipated were essentially the same for those entering the exhibition as for those entering the museum.¹

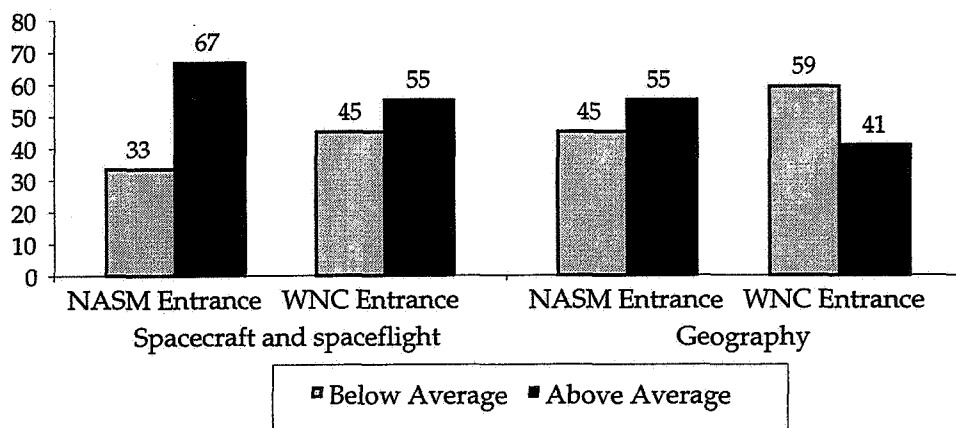
We also hypothesized that different degrees of interest in various subjects might offer some clue to understanding self-selection into the exhibition. Using a scale from 1 (low) to 5 (high), we asked visitors to rate their levels of interest in art, history, science and technology, aircraft and aviation, natural history, photography, spacecraft and spaceflight, geography, astronomy, and biography. For visitors entering the museum,

¹ The differences between the types of experiences that visitors entering the museum most anticipate and those that visitors entering the exhibition most anticipate were not statistically significant (Chi-square=6.5, df=3, p=.09).

the average level of interest in these areas ranged from a high of 3.96 (science and technology) to a low of 3.09 (biology).² Average interest in astronomy (3.34) was lower than interest in aircraft and aviation (3.57)³ or spacecraft and spaceflight (3.85).⁴

Museum visitors with relatively high levels of interest (4 or 5 on the 5-point scale, i.e., the scores that are above the averages) in either spacecraft and spaceflight or geography were less likely to enter the exhibition. While 67 percent of NASM visitors reported relatively high levels of interest in spacecraft and spaceflight, only 55 percent of visitors entering *Where Next, Columbus?* (WNC) reported high interest in spacecraft and spaceflight,⁵ and while 55 percent of visitors entering NASM had relatively high interest in geography, only 41 percent of those entering the exhibition had high interest in geography.⁶ See Figure 1.

Figure 1
Level of Subject Matter Interest
(In Percent)



These unexpected effects may be due to the impression of the exhibition that visitors obtained from the title and the appearance of the entrance gallery (which emphasized historical instances of exploration and discovery).

Visitors about to enter the exhibition who looked into the entrance gallery saw life-size models of children, a Spanish explorer and an astronaut, a case with a sailing ship, a case with a globe, and extensive wall texts and graphic images. If they looked high over head they saw a photograph of Mars on a field of stars, a hanging model of a spacecraft, and the title of the exhibition.

In response to our question asking entering visitors what they thought the exhibition would be about, more visitors thought it would be about history, Columbus, or exploration in general, than thought that it would be about space exploration:

² This difference is statistically significant: $t=10.4$, $N=424$, $p<.001$.

³ $t=3.3$, $N=424$, $p<.001$.

⁴ $t=7.1$, $N=424$, $p<.001$.

⁵ Chi-square=7.3, $df=1$, $p=.007$.

⁶ Chi-square=6.1, $df=1$, $p=.014$.

- 57% thought it would be about Columbus, history, or exploration in general
- 29% thought it would be about space exploration
 - 20% Exploring in outer space/planets/moon
 - 4% Flight/Air travel
 - 2% Advances in exploration/technology
 - 2% Traveling to/exploring Mars
 - 1% Life on other planets/settling in space
- 5% thought it would be about something else
 - 4% Tomorrow/future
 - 1% Vastness of space/how small we are
- 9% said they did not know what it would be about

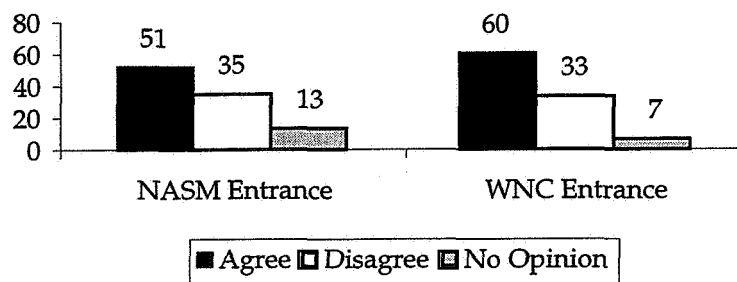
It seems from these responses that visitors were basing their opinion primarily on what they could see at the point of entry.⁷

When we designed the study, we hypothesized that the decision to enter the exhibition might be affected by how a person felt about the idea of exploring other planets. To test this view, visitors were asked to agree or disagree with three specific statements about Mars exploration:

- “Exploring Mars should be the top priority for America’s space program.”
- “We should send astronauts to Mars.”
- “We should settle on Mars.”

As illustrated in Figures 2 and 3, the first two questions were answered about the same way by visitors entering the museum and those entering the exhibition:⁸

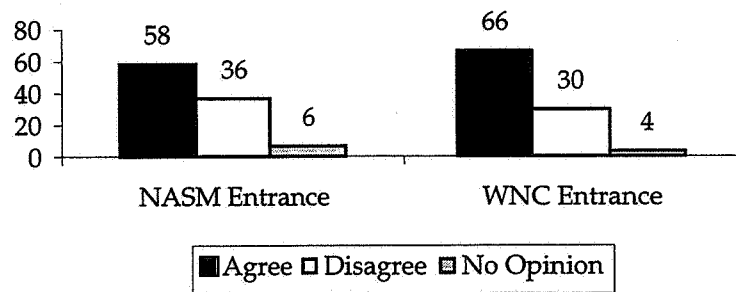
Figure 2
Visitor Opinion on
“Exploring Mars should be the top priority for America’s space program.”
 (In Percent)



⁷ 13% of visitors in WNC had been to the exhibition before. Only 1% of visitors entering NASM had come to the museum to see *Where Next, Columbus?* in particular.

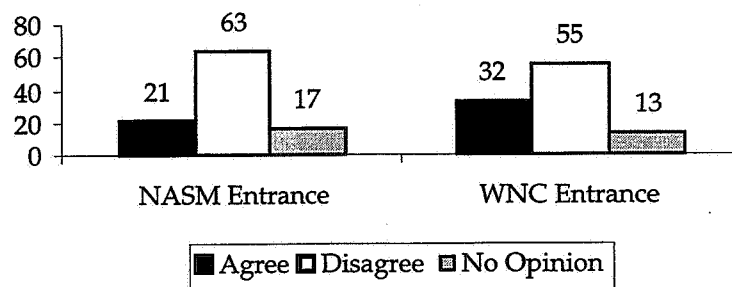
⁸ Top priority: Chi-square=5.6, df=2, p=.06, N=410; Send astronauts: Chi-square=3.7, df=2, p=.16, N=410.

Figure 3
Visitor Opinion on
"We should send astronauts to Mars."
(In Percent)



Opinions on the third question differed substantially between those entering the museum and those entering the exhibition, as shown in Figure 4.⁹

Figure 4
Visitor Opinion on
"We should settle on Mars."
(In Percent)



The idea of settling on Mars was 11 percent more popular with visitors entering the exhibition than with visitors entering the museum, suggesting that the exhibition was attracting some visitors who especially favor the idea of settling in space.

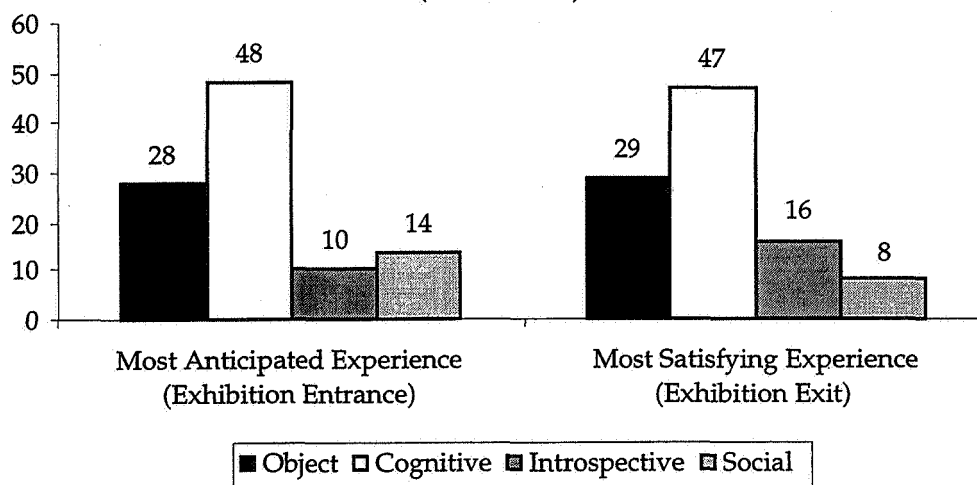
Visitors Leaving the Exhibition

The distribution of most satisfying experiences in the exhibition is virtually the same as the distribution of most anticipated experiences at the beginning of the exhibition, as shown in Figure 5.¹⁰

⁹ Chi-square=7.1, df=2, p=.03, N=410.

¹⁰ The difference between the two distributions is not statistically significant. (Chi-square=5, df=3, p=.2)

Figure 5
Types of Experiences in *Where Next, Columbus?*
(In Percent)



The strength of anticipation also parallels the strength of satisfaction, that is, the percentage of people who looked forward to each type of experience very strongly is also very close to the percentage of people who felt very strongly satisfied by that type of most satisfying experience.

It seems, then, that *Where Next, Columbus?* is not pushing visitors towards one type of experience over any other. Exiting visitors were satisfied by the same types of experiences that entering visitors anticipated, and exiting visitors were finding these kinds of experiences satisfying to the same degree that entering visitors were looking forward to them.

In the case of *Where Next, Columbus?*, satisfying experiences can offer some useful information about how different parts of the exhibition were valued by visitors. Exiting visitors gave these locations as places where they especially noticed having their most satisfying experience:

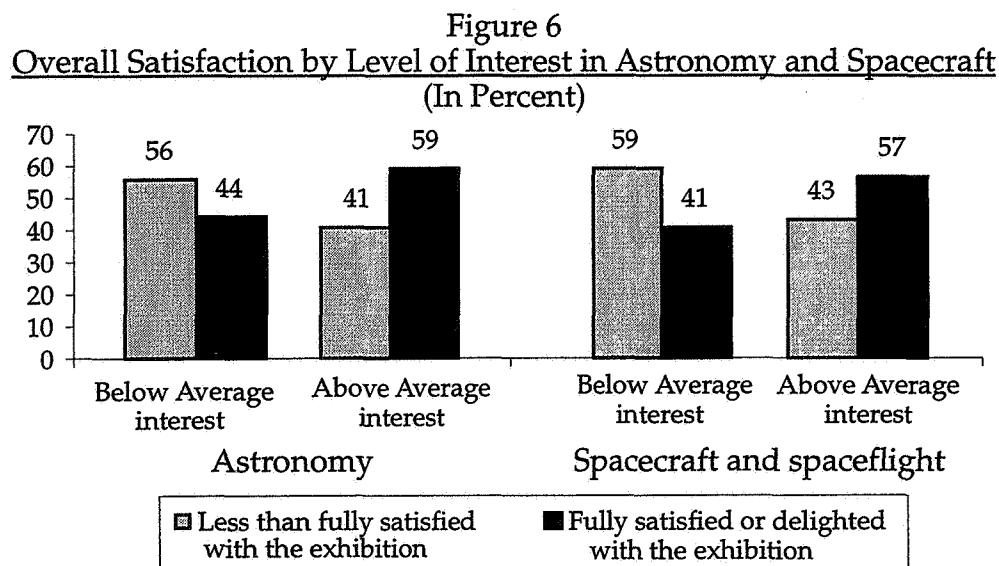
- 26% Mars Surface Gallery
- 21% Stellarium
- 7% Entry room
- 7% Exit room
- 4% Mars Lander
- 4% Movie
- 3% Space station
- 28% Don't know/no single place in particular

Two locations were the major sources of visitors' most satisfying experiences – the Mars Surface Gallery and the Stellarium. Nearly half (47%) of all exiting visitors found their most satisfying experience either in the Mars Surface Gallery or the Stellarium.

For those who said that the Mars Surface Gallery was the location of their most satisfying experience, 60 percent said it was a Cognitive experience. For those who said that the Stellarium was the location of their most satisfying experience, 43 percent said it was an Object experience.

The Stellarium may have had a positive impact on visitors' overall satisfaction with the exhibition. Among all exiting visitors, exactly half said that they were fully satisfied or delighted with the exhibition.¹¹ But among visitors who said that their most satisfying experience was the Stellarium, 68 percent were fully satisfied or delighted with the exhibition.

Visitors who expressed a high interest in astronomy were more likely to indicate that the exhibition overall was fully satisfying (59% vs. 41%).¹² Those with a high interest in spacecraft and spaceflight were also more likely to be fully satisfied overall with *Where Next, Columbus?* (57% vs. 43%).¹³ See Figure 6.



The exhibition aims to influence visitors to think more deeply about the prospects for exploring other planets. The large text panel that introduces the exhibition reads as follows:

Sailing across an uncharted sea 500 years ago, Christopher Columbus launched voyages of exploration and discovery that changed the world. No one in Europe or the Americas predicted the encounter of quite different cultures. Nobody imagined the resultant "New World."

Today, our home planet is well traveled; its frontiers have been pioneered and populated; the vast oceans are easily crossed. We have ventured into space, and we talk of settling the Moon and Mars. We have become spacefarers.

Will we continue to explore the planets and stars? This exhibition examines our prospects for exploration and discovery of new worlds in space in the next 500 years. What are the challenges, choices, and consequences that we must consider as we make decisions about future exploration?

¹¹ We believe that the other half were dissatisfied to some extent, since they had to reject these two levels of satisfaction in answering the question. The complete set of options was: Disappointing, Somewhat disappointing, Satisfying, Fully satisfying, and Delightful.

¹² Chi-square=6.6, df=2, p=.04.

¹³ Chi-square=7.8, df=2, p=.02.

Accordingly, we asked exiting visitors to express the main idea they came away with. They gave the following types of responses:

- 43% Space exploration
 - 11% Exploring in outer space/planets/moon
 - 9% Traveling to/exploring Mars
 - 6% Life on other planets/settling in space
 - 5% Advances in exploration/technology
 - 4% What Mars looks like
 - 3% Reasons to explore/whether we should or not
 - 3% Traveling farther in the universe
 - 1% Flight/air travel
 - 1% Life of astronauts
- 20% Columbus, history, or exploration in general
- 15% Something else
 - 8% Vastness of space/how small we are
 - 5% Tomorrow/future
 - 1% Unanswered questions in our universe
 - 1% Other
- 22% Don't know
 - 13% No idea/don't know
 - 9% Did not get a main idea/no main idea

The curator's intention in this exhibition is to stimulate visitors to think more deeply about space exploration, but even if they engaged in such thinking, their opinions of Mars exploration were unaffected. Between exhibition entrance and exhibition exit there was no shift on the three opinion questions about exploring Mars.¹⁴

Although there are no indications that this exhibition made a significant impact on visitors' thinking about exploring the planets, it may have influenced them in other ways. For example, eight percent of exiting visitors said that the main idea they came away with was "the vastness of space" or "how small we are." This meaning was probably influenced by the Stellarium.¹⁵

¹⁴ Top priority: Chi-square=1.1, df=2, p=.57; Send astronauts: Chi-square=2.6, df=2, p=.28; Settle on Mars: Chi-square=0.3, df=2, p=.89.

¹⁵ See Interview Study Results: Stellarium on page 14.

II. The Exhibition Interview Study

Introduction

To further understand the visitors' experience in *Where Next, Columbus?*, ISO staff recorded interviews at four exhibition "settings": the Space Station, the Mars Surface Gallery, the Mars Lander, and the Stellarium. In particular we wanted to explore the impact of these unique installation designs on visitor imagination and comfort (i.e., crowding, temperature, light levels, etc.).

The Space Station is an area immediately following the first gallery. Its monitors and physical features imitate the inside of a space station. It is brightly lit, and includes a rotating model of a space station near Mars. The subject matter of the gallery focuses on the physical effects of life in space, and this subject is represented by a mannequin on an exercise device suspended upside down from the ceiling to suggest weightlessness.

The Mars Surface Gallery is a relatively large room containing a walk-through Martian landscape, with rocks, a scenic mural, a figure in a space suit, and models of Mars-exploring robots, including Pathfinder and Sojourner. There is a computer interactive station on constructing robots and a video of robots in action. The ceiling is black and the room is dimly and dramatically lit.

The Mars Lander is designed to suggest the inside of a spacecraft that lands on Mars and supports a crew on the planet's surface. It is a small space, very brightly lit, that includes a computer interactive station in which the visitor can join the crew en route to Mars, as well as a large display of living plants that are being grown under lights for food.

The Stellarium is a fiber-optic model of a portion of our galaxy that includes our solar system. It is contained within a large, cylindrical Plexiglas in a very dark, circular room of its own. A recording periodically describes the model and uses blinking lights to discuss particular stars.

Method

We decided to base our investigation on recorded interviews with small samples of visitors rather than to incorporate these issues into the survey study because we thought that these issues would require too many questions and too much probing. The survey questionnaire was already relatively long and we did not want to reduce response rates by making it longer.

Visitors were intercepted as they became available at the interview locations, near the end-points of these four galleries. No systematic selection method was employed.

The interviews were conducted by three ISO staff members during the same time period as the survey study. Altogether 46 interviews were recorded. The average interview time was eight minutes.

The Interview Guide

Interviewers addressed three main topics: satisfaction and imagination, physical environment and comfort, and attitudes towards Mars exploration.

Under the topic of satisfaction and imagination, we sought to uncover what is satisfying about the experience of these spaces. Are visitors imagining themselves in other times or places, or are these spaces functioning in a more clearly cognitive way (i.e., providing information in a well-designed context)?

In general, we wanted to understand the impact of the physical environment in these specially designed spaces. Two of these areas are dark (the Mars Surface and the Stellarium) and two are bright. Do these lighting differences have any impact on the visitors? Are they causing any problems? Do they have benefits? Does the ramp around the Martian Surface cause older visitors difficulty? What about the soundtrack in the Stellarium?

Finally, we wanted to know if the exhibition was influencing attitudes towards Mars exploration.

Interview Study Results

The Four Settings

Although we identified each of these four areas as a “setting” which might inspire visitors’ imaginations, the interviews suggested that only two of the areas communicated the feeling of an environment to visitors – the Mars Surface and the Stellarium. Both of these areas contrast sharply with the rest of the exhibition in lighting and architecture. The Mars Lander and Space Station were not seen as “environments” in the same way, perhaps because their design elements were more consistent with conventional exhibitions elsewhere.

Visitors (particularly children) told us about satisfying imaginative experiences in the Mars Surface Gallery and the Stellarium and also described satisfying Cognitive and Object experiences in all four of the settings. We also noticed that visitors in the Mars Surface Gallery and the Stellarium were generally more responsive to our inquiries about their experiences than visitors in the Space Station and the Mars Lander.

When we asked about the impact of environmental conditions, we heard mostly about temperature. Temperature affected visitor experiences both positively (where the exhibition was refreshingly cool, mostly in the Mars Surface Gallery) and negatively (when the exhibition was too warm, mostly in the Mars Lander).

Visitors’ attitudes towards Mars and Mars exploration were generally positive, but seemed to have been reinforced rather than altered by their exhibition experience. While people enjoyed learning more about Mars exploration and possibilities, they were already familiar with the concepts and ideas presented in the exhibition.

Each of the four areas is discussed separately below, with quotations from visitor interviews.

Mars Surface Gallery

The Mars Surface Gallery definitely conveyed the feeling of a "setting" to visitors. This environment facilitated imaginative experiences for some visitors.

"When you walked in the door you instantly knew that you were. . . . that you had put effort into recreating that we had landed somewhere else."
(C-1)¹⁶

Children, in particular, liked imagining Mars and life on Mars.

(Female) "Made me feel a little bit more like I was on Mars. Or actually feeling what the area might be like there." (Male) "I thought it was neat how they did the rocks and give you a feeling that you are actually on a different world, or a different atmosphere, different planet with the coloring of the rocks and all that stuff." (Female) "So I felt a part of the exploration . . . I like the fact that you go up and ramp and come down with the walls looking like rock and stuff, it gives you more of a feeling of walking on Mars." (C-4)

Visitors mentioned the Mars robot models, Sojourner and Pathfinder, said that they were excited to see them, and surprised at the "currentness" of the exhibition. The computer interactive was a big attraction for many visitors, although some reported having trouble getting it to work.

"Just thinking about the Pathfinder mission and everything and it went to Mars and all. It's interesting." (B-3)

"I liked that you had the Pathfinder and Sojourner. Really, very contemporary. You never expect something that's a year or two old to already be in someplace." (C-1)

"Seeing the Sojourner model, replica, well I watched the Sojourner on TV when it happened before and I, like many others, were surprised at the perfection of its workings and to actually see it and get a full idea of the size of it was delightful." (C-5)

People were generally pleased with the environment. One gentleman in a wheelchair mentioned that the steepness of the ramp made movement in the area difficult. In addition, a number of visitors mentioned liking the cool temperature in this area of the exhibition.

¹⁶ Quotations from visitors are followed by an interview id number.

Stellarium

The Stellarium was also perceived as a special "setting" by visitors. Visitors found this environment conducive to feeling as though they were looking at the stars in the sky, thinking about the universe, and letting their minds wander. As one visitor stated, "It gives you more of a remote feeling. Even though you are in there with other people you get a feeling of, a sensation of sort of looking off into space." (C-18)

For some visitors, the Stellarium was a very Introspective experience. Some of them mentioned blocking the audio guide out and thinking about "how small we are," "the size of the universe," and "what heaven is like." Other visitors listened to the audio and enjoyed learning about the various stars and thinking about "what an astronaut would see" and "other planets."

"When it came on it was interesting seeing where some of the brighter stars because I recognized the names of some of them . . ." (daughter)
"We learned lots of stuff!" (A-2)

Visitors also mentioned they liked the Stellarium because they were able to see the stars in dimension, and not as a flat image. The darkness attracted people into the space and visitors also mentioned being drawn to the Milky Way image at the Stellarium entrance.

"More real. More real. Cause you're sitting at home looking through a telescope you can see it, but yet you see one side of it. But here you can walk around it and see it has dimension. And that makes it more physical." (B-3)

The environmental conditions were not completely favorable. Because of the darkness in this area, and the preponderance of school-groups during the period of the study, the Stellarium attracted a number of school-age kids who disrupted the visit experience for others. In addition, a few visitors felt that it was too warm.

Mars Lander

The two major attractions of this area are the plants and the computer interactive, both of which provided satisfying experiences for visitors. Overall, the area did not convey the idea of a "setting" to visitors. Finally, the warm temperature in this area seriously discouraged visitors from spending much time in the Mars Lander.

"And we're also very attracted to the growing plants. We grow vegetables and other things. My youngest son always wants to see what you're growing this time. And is pleased that they change." (C-3)

"I was interested in the plants as a good way to illustrate the situation. And I know he [son] was thinking about what it would be like to live there one day." (B-5)

"The plants, I just like green stuff. Saying 'Ah that's neat! You can grow things in space.' It's very realistic." (B-6)

Interviewer: "What was most satisfying for you?" Respondent: "My son's enjoyment of doing the launch. Feeling he was participating in it, making decisions. He got real information about real situations. And as I said, he felt as if he was making decisions." (C-14)

"It's very hot in there and a number of people who came in there said the same thing. My husband had to leave because it was too hot in there. And because that [interactive] takes a while to do . . . There was no place to sit. Since I was standing there with my son I didn't want to leave him there. So I was on the floor which was fine for me but maybe not for everybody." (C-14)

Space Station

Visitors did not see this area as a distinct "environment." Some visitors thought the information was overwhelming and perhaps "too much" to hold their attention. The module and the movement of it caught visitors' attention as did the video, "Staying in space." Overall, however, people did not spend a great deal of time in this area.

"There's a lot of stuff to look at . . . it's hard to get it all without staying a long time . . . it's hard to focus on any one thing because there's so many things in here." (C-10)

"The animation of the space ship itself is one of the things that drew me to this particular display, it was actually moving, showing the actual movement of what it would be like in flight." (C-11)

"This is interesting – Staying Fit in Space . . . I didn't know some of this, these special exercises they need to do in space. I didn't realize that even a short flight, that it made that much of a difference in a few days." (C-8)

Summary and Implications

Visitors came to NASM looking forward to a wide range of experiences, primarily Gaining knowledge, Enriching understanding, Seeing the "real thing," and Seeing rare and valuable things. To a lesser extent, they anticipated Social and Introspective experiences as well.

According to their own ratings, these visitors have relatively high levels of interest in many subjects, especially science and technology, and spacecraft and spaceflight. Over half believe that exploring Mars should be a top priority for America's space program and that we should send astronauts to Mars. They are less convinced of the need to settle on Mars. Less than half agree that we should settle on Mars.

When these visitors approached the entrance to *Where Next, Columbus?* the majority seem to have gotten the impression from the title and the entry gallery that the exhibition is about Columbus, history, or exploration in general. Those most interested in spacecraft and spaceflight were less likely than others to enter. Less than a third realized that the exhibition was about space exploration and almost no one who entered the exhibition realized that Mars would be featured prominently

The experiences that the audience found most satisfying in the exhibition were primarily the same types that the visitors as a whole most anticipated. They were especially impressed by the Mars Surface Gallery and the Stellarium, where nearly half of visitors found their most satisfying experiences. The Mars Surface Gallery was most satisfying as a Cognitive experience and the Stellarium as an Object experience.

The interviews confirmed the attraction of these two special environments. The Mars Surface Gallery impressed some visitors through its up-to-date contents and an appealing interactive on constructing robots. The Stellarium inspired thoughts about the universe and our place in it.

Whether or not the exhibition encouraged visitors to think more deeply about the prospects for space exploration, it seems unlikely that it had a major impact on their attitudes regarding that topic, since the range of opinions on the space program, exploring Mars, and settling on Mars were the same on exit as on entrance.

Half of the exiting visitors felt fully satisfied or delighted with the exhibition overall, and those who had their most satisfying experience in the Stellarium were considerably more satisfied than other visitors.

We believe that this study has two clear lessons for future exhibitions in NASM:

- 1) The title and the entrance area can be extremely important in determining who enters the exhibition and what they expect to find.

The exhibition's title and entrance gallery apparently discouraged visitors with a strong interest in spacecraft and spaceflight from entering. This is unfortunate, since the responses of exiting visitors indicated that those with a strong interest in spacecraft and spaceflight were more satisfied with the exhibition than other visitors. In view of this, we recommend that planning teams test their exhibition title in the galleries to find out what it implies to visitors. In addition, planning teams need to give careful thought to

the impression given by the entrance gallery. Is the entrance gallery indicative of the exhibition as a whole? Will visitors realize at a glance what this exhibition is about?

2) Visitors respond well to installations that are suggestive and artistic.

The very positive responses to the Mars Surface Gallery and the Stellarium, in particular, imply that visitors might respond very favorably to any areas in new exhibitions that viscerally suggest the vastness and beauty of the universe.

References

Pekarik, A. J., Doering, Z. D., & Karns, D. A. (1999). Exploring Satisfying Experiences in Museums. *Curator*, 20(2), 56-68.

id [][][][]

interv C M S H R

Count _____

Hi. My name is _____. I work for the Smithsonian. I'm talking to people about their visit to "Where Next, Columbus?" today.

1. Is today your first visit to this museum? q1btimes [][]

Yes GOTO TO Q3

No 1b. How many times have you been here before today? _____

2. Have you ever visited this particular exhibition "Where Next, Columbus" before?

No/can't remember Yes

*3. Where do you live? statecity [][][]

- Washington, DC Other US _____
- MD/VA suburbs Foreign _____

4. On this card are some experiences that people have told us were satisfying to them in exhibitions.

[SHOW CARD] Which of these are you looking forward to having in this particular exhibition, "Where Next, Columbus"? Choose all that apply.

[Mark all] Anything else?

- g. spending time with k. gaining knowledge
- c. children learning w. reflecting on meaning
- b. moved by beauty x. continuing prof. devel.
- r. seeing rare, valuable things s. spiritual connection
- j. seeing real thing i. imagining
- o. thinking about owning m. recalling memories
- u. enriching understanding f. feeling connected

5. Which one of those are you MOST looking forward to in this exhibition, "Where Next, Columbus?" (repeat selected items if necessary)

If first choice is g or c, ask for 2nd, 3rd. (character-uppercase)

1st _____ 2nd _____ 3rd _____ sat1st sat2nd sat3rd [][][]

6. How strongly are you looking forward to it? Not so strongly, strongly or very strongly?

- 1st 1 Not so strongly 2 Strongly 3 Very strongly
- 2nd 1 Not so strongly 2 Strongly 3 Very strongly
- 3rd 1 Not so strongly 2 Strongly 3 Very strongly

ADMIN BOX card a b c status Interview Ref: lang SI staff Ref: other Inelig. Entrance location session [][] segment 1 3 2 4

8. Now I'm going to ask you about your interest in some subjects. Use a scale from 1 to 5 where 1 means not interested and 5 means very interested. How interested are you in...

- art _____ photography _____
- history _____ spacecraft and spaceflight _____
- science and technology _____ geography _____
- aircraft and aviation _____ astronomy _____
- natural history _____ biography _____

artint hisint sciint airint natint photint spacint geoint astrint bioint [][][][][][][][][][][][][][][][][][][]

10. In your opinion, what do you think this exhibition "Where Next, Columbus?" will be about? Q10wnc [][]

11. For each statement that I will read, please tell me the number that comes closest to how you feel. [SHOW CARD] There are no right or wrong answers. [1str.disagree 2disagree 3agree 4str.agree 9no opinion]

- A. Exploring Mars should be the top priority for America's space program. 1 2 3 4 9
- B. We should send astronauts to Mars. 1 2 3 4 9
- C. We should settle on Mars. 1 2 3 4 9

Now just a few questions about you ...

- *14. Who are you here with today? (code whole group) Alone Adult(s) with child(ren)/teens 2 adults 2+ teens 3+ adults Tour/school group

15. Was there something in particular you wanted to see or do in this museum today? partwhat [][]

- No Yes What? _____

*16. What is your age? age [][]

- 17. What is the highest level of education you have completed? HS grad or less Bachelor's degree Assoc/Jr/Tech Some graduate study Some college MA/Ph.D/Profess.

- *18. What is your racial/ethnic identity? African American/Black Native Am./AK Native Asian/Pac. Islander Multiple Caucasian/White Other Hispanic/Latino

*19. Mark gender: Female Male

THANK YOU



id

interv C M S
 H R

Count _____

Hi. My name is _____. I work for the Smithsonian. I'm talking to people about their visit to *Where Next, Columbus?* today.

1. Is today your first visit to this museum? q1btimes
- Yes GOTO TO Q3
- No : 1b. How many times have you been here before today? _____

2. Have you ever visited this particular exhibition "Where Next, Columbus" before?
- No/can't remember Yes

- *3. Where do you live? statecity
- Washington, DC Other US _____
- MD/VA suburbs Foreign _____

4. On this card are some experiences that people have told us were satisfying to them in exhibitions.

SHOW CARD Which of these were satisfying for you in this particular exhibition, gesture with hand "Where Next, Columbus"? Choose all that apply?

Mark all Anything else?

- | | |
|---|--|
| <input type="radio"/> g. spending time with | <input type="radio"/> k. gaining knowledge |
| <input type="radio"/> c. children learning | <input type="radio"/> w. reflecting on meaning |
| <input type="radio"/> b. moved by beauty | <input type="radio"/> x. continuing prof. devel. |
| <input type="radio"/> r. seeing rare, valuable things | <input type="radio"/> s. spiritual connection |
| <input type="radio"/> j. seeing real thing | <input type="radio"/> i. imagining |
| <input type="radio"/> o. thinking about owning | <input type="radio"/> m. recalling memories |
| <input type="radio"/> u. enriching understanding | <input type="radio"/> f. feeling connected |

5. Which one of those was MOST satisfying for you in this exhibition, "Where Next, Columbus?" (repeat selected items if necessary)

If first choice is g or c, ask for 2nd, 3rd. (character-uppercase)

1st _____ 2nd _____ 3rd _____ sat1st sat2nd sat3rd

6. How strong was your sense of satisfaction with that? Not so strong, strong or very strong?

1st 1 Not so strong 2 Strong 3 Very strong

2nd 1 Not so strong 2 Strong 3 Very strong

3rd 1 Not so strong 2 Strong 3 Very strong

7. Where in this exhibition "Where Next, Columbus" did you especially notice having that experience?

Q7wnc

8. Now I'm going to ask you about your interest in some subjects. Use a scale from 1 to 5 where 1 means not interested and 5 means very interested. How interested are you in...

- | | |
|------------------------------|----------------------------------|
| art _____ | photography _____ |
| history _____ | spacecraft and spaceflight _____ |
| science and technology _____ | geography _____ |
| aircraft and aviation _____ | astronomy _____ |
| natural history _____ | biography _____ |

artint	hisint	sciint	airint	natint	photint	spacint	geoint	astrint	bioint
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

10. After seeing this exhibition "Where Next, Columbus?" what is the main idea you came away with? probe

_____ Q10wnc

11. For each statement that I will read, please tell me the number that comes closest to how you feel. SHOW CARD There are no right or wrong answers. [1str.disagree 2disagree 3agree 4str.agree 9no opinion]

A. Exploring Mars should be the top priority for America's space program. 1 2 3 4 9

B. We should send astronauts to Mars. 1 2 3 4 9

C. We should settle on Mars. 1 2 3 4 9

12. How would you rate your overall satisfaction with this exhibition today? Was it delightful, fully satisfying, satisfying, somewhat disappointing, or disappointing?

- Delightful
- Fully satisfying
- Satisfying
- Somewhat disappointing
- Disappointing

13. If you were the director of the Air and Space Museum, is there anything for visitors you would improve, change or add in this exhibition?

Q13dir



Now just a few questions about you ...

*14. Who are you here with today? (code whole group)

- Alone
- Adult(s) with child(ren)/teens
- 2 adults
- 2+ teens
- 3+ adults
- Tour/school group

15. Was there something in particular you wanted to see or do in this museum today?

- No partwhat
- Yes What? _____

*16. What is your age? _____ age

17. What is the highest level of education you have completed?

- HS grad or less
- Bachelor's degree
- Assoc/Jr/Tech
- Some graduate study
- Some college
- MA/Ph.D/Profess.

*18. What is your racial/ethnic identity?

- African American/Black
- Native Am./AK Native
- Asian/Pac. Islander
- Multiple
- Caucasian/White
- Other
- Hispanic/Latino

THANK YOU

*19. Mark gender:

- Female
- Male

ADMIN BOX	card	<input type="radio"/> a	<input type="radio"/> b	<input type="radio"/> c	status
session	segment	location	<input type="radio"/> Interview	<input type="radio"/> Ref. lang	
<input type="text"/> <input type="text"/>	<input type="radio"/> 1 <input type="radio"/> 3	<input checked="" type="radio"/> Exit	<input type="radio"/> SI staff	<input type="radio"/> Ref. other	
	<input type="radio"/> 2 <input type="radio"/> 4		<input type="radio"/> Inelig.		



id [][][][]

interv C M S
 H R

Count _____

Hi. My name is _____. I work for the Smithsonian. I'm talking to people about their visit today.

8. Now I'm going to ask you about your interest in some subjects. Use a scale from 1 to 5 where 1 means not interested and 5 means very interested. How interested are you in...

art _____ photography _____
history _____ spacecraft and spaceflight _____
science and technology _____ geography _____
aircraft and aviation _____ astronomy _____
natural history _____ biography _____

artint hisint sciint airint natint photint spacint geoint astrint bioint
[][] [][] [][] [][] [][] [][] [][] [][] [][] [][]

1. Is today your first visit to this museum?

Yes 1a. Before today, have you visited other Smithsonian museums? Yes No

No 1b. How many times have you been here before today? [][] qlbtimes

*3. Where do you live? stately [][][]

Washington, DC Other US _____
 MD/VA suburbs Foreign _____

4. On this card are some experiences that people have told us were satisfying to them in the Air & Space museum. [SHOW CARD] Which of these are you looking forward to having in this museum today? Choose all that apply. [Mark all] Anything else?

g. spending time with k. gaining knowledge
 c. children learning w. reflecting on meaning
 b. moved by beauty x. continuing prof. devel.
 r. seeing rare, valuable things s. spiritual connection
 j. seeing real thing i. imagining
 o. thinking about owning m. recalling memories
 u. enriching understanding f. feeling connected

5. Which one of those are you MOST looking forward to in this museum? (repeat selected items if necessary) If first choice is g or c, ask for 2nd, 3rd. (character-uppercase)

1st _____ 2nd _____ 3rd _____
[][] [][] [][]
sat1st sat2nd sat3rd

6. How strongly are you looking forward to it? Not so strongly, strongly or very strongly?

1st 1 Not so strongly 2 Strongly 3 Very strongly
2nd 1 Not so strongly 2 Strongly 3 Very strongly
3rd 1 Not so strongly 2 Strongly 3 Very strongly

11. For each statement that I will read, please tell me the number that comes closest to how you feel. [SHOW CARD] There are no right or wrong answers.

[1str.disagree 2disagree 3agree 4str.agree 9no opinion]

A. Exploring Mars should be the top priority for America's space program. 1 2 3 4 9

B. We should send astronauts to Mars. 1 2 3 4 9

C. We should settle on Mars. 1 2 3 4 9

Now just a few questions about you ...

*14. Who are you here with today? (code whole group)

Alone Adult(s) with child(ren)/teens
 2 adults 2+ teens
 3+ adults Tour/school group

15. Was there something in particular you wanted to see or do in this museum today?

No Yes What? _____ partwhat [][]

*16. What is your age? _____ age [][]

17. What is the highest level of education you have completed?

HS grad or less Bachelor's degree
 Assoc/Jr/Tech Some graduate study
 Some college MA/Ph.D/Profess.

*18. What is your racial/ethnic identity?

African American/Black Hispanic/Latino
 Asian/Pac. Islander Native Am./AK Native
 Caucasian/White Multiple
 Other

Now, I have just one last question to ask you.

ADMIN BOX card a b c status
segment location Interview Ref. lang
session 1 3 Mall Side SI staff Ref. other
[][] 2 4 Constitution Inelig.



9. On this card is a list of feelings that people have told us about when visiting the Smithsonian. show card How strong are these feelings for you on this visit? If we give you 5 points total, how would you distribute them over this list so it adds up to 5? You don't have to use all your points. [If needed: You can split them up any way you want. For example, give all 5 points to one, give 3 to one and 2 to another, etcetera.]

- s ____ Being in a very special place
- d ____ Feeling a sense of excitement or discovery
- r ____ Being relaxed or comfortable
- p ____ Feeling a sense of pride
- e ____ Feeling entertained

- x ____ Unused points

s	d	r
<input type="text"/>	<input type="text"/>	<input type="text"/>
p	e	x
<input type="text"/>	<input type="text"/>	<input type="text"/>

THANK YOU

*19. Mark gender:

- Female Male



s _____ Being in a very special place

d _____ Feeling a sense of excitement or discovery

r _____ Being relaxed or comfortable

p _____ Feeling a sense of pride

e _____ Feeling entertained

z _____ Unused points

- k. Gaining information or knowledge
- x. Continuing my professional development
- s. Feeling a spiritual connection
- c. Seeing my children learning new things
- f. Feeling a sense of belonging or connectedness
- j. Seeing "the real thing"
- o. Thinking what it would be like to own such things
- u. Enriching my understanding
- w. Reflecting on the meaning of what I was looking at
- b. Being moved by beauty
- i. Imagining other times or places
- r. Seeing uncommon/rare/valuable things
- g. Spending time with friends/family/other people
- m. Recalling my travels/ childhood experiences/ other memories

strongly disagree

1

disagree

2

agree

3

strongly agree

4

no opinion