

*Exploring Amazonia*

**Three Studies of Visitors  
at the National Zoological Park**

**INSTITUTIONAL STUDIES**



Smithsonian  
Institution

*Exploring Amazonia*

Three Studies of Visitors  
at the National Zoological Park

**Observations of Visitors**

David Karns with Steven J Smith

**Survey of Entering and Exiting Visitors**

Stacey Bielick with David Karns

**Interviews with Selected Families**

Andrew J. Pekarik with Gary Shank

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## ACKNOWLEDGEMENTS

The publication of these studies, conducted at the Amazonia exhibition and Amazonia Science Gallery, National Zoological Park (NZN), provides an opportunity to acknowledge the dedication, commitment, and skill of many professionals in several organizations.

The studies were initiated by Miles Roberts, Deputy Head, Department of Zoological Research, and David M. Jenkins, Associate Director for Interpretive Programs, NZN. Both had been involved in the development of the Amazonia Science Gallery and, as the Gallery approached its 4th anniversary, they wanted to step back and objectively understand its role in the experience of visitors to NZN.

Throughout the studies, Miles was our client, major contact, colleague and supporter; we appreciate his insights and enthusiasm. Our work was facilitated by Amazonia Science Gallery staff, including Ryan Valdez, ASG Research/Education Coordinator; Frank Kohn, Biological Technician; Adrian Cerezo, ASG Education Specialist; and Vince Rico, Assistant Curator, Amazonia.

In the Institutional Studies Office, Stacey Bielick had primary responsibility for all aspects of data collection for both the observation and survey studies. She was assisted by Susan Timberlake, an intern from Duke University. Stacey Bielick also had primary responsibility for the analysis and reporting of the survey data. Portions of the analysis were executed by David Karns, who also had primary responsibility for the analysis and reporting of the observational data, with the assistance of Steven J Smith.

The qualitative study was conducted and reported by Andrew J. Pekarik. The analysis was guided by the insights and collaboration of Gary Shank, Associate Professor, School of Education, Duquesne University. Kaya Townsend, an intern in the Institutional Studies Office, assisted with the bibliography and interviewing.

## SUMMARY

The Institutional Studies Office designed a series of studies to provide National Zoological Park (NZP) staff with reliable information about the experience of visitors in the Amazonia building, especially in the Amazonia Science Gallery.

The Amazonia building begins with a two-level Amazonia exhibition featuring fish tanks and a Field Station on the first floor and a rainforest habitat space on the second. As visitors leave the exhibition they pass through a connecting area on the second floor. Some visitors choose to exit the Amazonia building at this connecting area. Those who elect to continue move down the stairs to the Amazonia Science Gallery, an 8,000-square-foot space with a high ceiling and design elements that subtly suggest South American architecture. The Science Gallery includes science labs (each with an open anteroom), an open laboratory, a GeoSphere (a 6' diameter, rotating, high resolution earth globe), computer stations, tables and chairs. The second building exit is at the end of the Amazonia Science Gallery.

The studies address these basic questions:

- A. How do visitors use Amazonia?
- B. Who uses it?
- C. Is the Amazonia Science Gallery successful?
- D. If so, how does it work for visitors?

The first question was addressed directly by an observation study, the second and third through a survey of visitors, and the fourth by in-depth interviews with families. Key results and a brief discussion follow.

### OBSERVATIONS OF VISITORS

- A. The average time in the building was 17 minutes. Dividing the audience according to the time they spent in the building, we find that:

One quarter of visitors (mostly those without children) spent less than 10 minutes in the whole building. On average they spent about equal amounts of time stopped in the Exhibition Entrance-Main (the gallery with the fish), the Habitat, and the Science Gallery.

Another quarter of visitors spent 10 to 15 minutes in the whole building. They stopped longer on average in the Exhibition Entrance-Main than in the Habitat or the Science Gallery.

Another quarter of visitors spent an average of 15 to 20 minutes in the building. These visitors spent equal amounts of time on average stopped in the Exhibition Entrance-Main, the Habitat, and the Science Gallery.

The final quarter of visitors spent 20 minutes or more in the building. On average they spent at least twice as long stopped in the Science Gallery as in the Exhibition Entrance-Main or the Habitat.

- B. Less than half of all visitors (45%) entered the Science Gallery.

Five percent of all visitors passed quickly through the whole building and spent an average of 1.6 minutes in the Science Gallery.

Approximately one fifth of all visitors went through the whole building, but did not spend long in the Science Gallery. They spent 3 minutes on average with the Science Gallery.

Approximately one-fifth of all visitors went through the whole building and were engaged in the Science Gallery. They spent an average of 11 minutes in the Science Gallery.

- C. The Science Gallery held engaged visitors not only because it had more activities, but also because it provided a different kind of atmosphere (e.g., Science Gallery microscopes held visitors longer on average than microscopes in the Field Station section of the exhibition).

#### SURVEY OF ENTERING AND EXITING VISITORS

- D. For visitors who saw the Amazonia exhibition, but did not see the Science Gallery, the most satisfying experiences were the same as elsewhere in the zoo, i.e., spending time with friends or family. For those who also went through the Science Gallery, the range of satisfying experiences was wider. This suggests that the Science Gallery complements the Amazonia exhibition experientially so that the two together provide a richer mix of satisfying experiences.
- E. All visitors left the Amazonia building somewhat less likely to think that taming the wild is a sign of progress.
- F. The Science Gallery had one clear effect on visitor attitudes. Visitors to the Science Gallery were much more likely to come away thinking that most people can understand the basic ideas of science. Visiting the Amazonia exhibition had no effect on this opinion.

#### INTERVIEWS WITH SELECTED FAMILIES

- G. For the visitors in these interviews, the Science Gallery functioned as a type of free-flowing community that encouraged experimentation, play, and social contact as well as thoughtful, private experiences.
- H. These adults used the Science Gallery in a way that was consistent with their parenting style and the general patterns of their relationships with their children.

This use was facilitated by the wide range of activity options in the Science Gallery.

- I. These visitors seemed to place their Science Gallery interactions within the broader context of their developmental experiences. The children were most deeply involved in Science Gallery activities when those activities reflected long-standing personal concerns.

The results of these studies overlap and confirm one another. They point towards the overall conclusion that the Amazonia building as a whole is an effective experience for visitors. They demonstrate that the large fish tanks and the rainforest habitat are especially pleasing to visitors; they indicate that the Science Gallery makes science feel more accessible; and they provide evidence that these two areas together provide an unusually broad range of satisfying experiences for visitors.

The Science Gallery component was designed to complement and extend the experience of the Amazonia exhibition. These studies show that the Amazonia Science Gallery is successfully meeting that goal through the range of its offerings and the special atmosphere that it provides.

In addition to answering the basic questions, however, these studies provide a wealth of additional information that will be helpful in charting the future direction of the Science Gallery.

## OVERALL INTRODUCTION

### OVERVIEW

This report documents the results of three related studies conducted by the Institutional Studies Office at the Amazonia building of the National Zoo in Washington, DC, in 1998.

#### Observations of Visitors

From June 18, 1998 to June 30, 1998, visitors were unobtrusively observed. A total of 139 visitors were selected for observation at the entrance to the building and all their stops (locations and duration) were recorded from that point until they left the building.

#### Survey of Entering and Exiting Visitors

During a two-week survey period, August 10 to August 22, 1998, three groups of visitors (a total of 239 respondents) were selected for interviews: (a) those who entered the Amazonia building, (b) those who left the building after viewing the Amazonia exhibition but who did not enter the Science Gallery, and (c) those who left the building after visiting both the Amazonia exhibition and the Science Gallery.

#### Interviews with Selected Families

On three days in late May and early June, 1998, 12 families who were seriously engaged in the Amazonia Science Gallery were interviewed in depth about their experience in the gallery and how it related to their lives and interests.

### THE AMAZONIA BUILDING

The Amazonia building contains two major spaces. The first is a rainforest exhibition on two levels (referred to in this report as the Amazonia exhibition). The second, which is accessed by a connecting hallway and a set of stairs, is the Amazonia Science Gallery.

### THE AMAZONIA EXHIBITION

The Amazonia exhibition, opened in November 1992, is a 15,000-square-foot exhibition that houses a recreation of a tropical rain forest and 358 species of fish and other animals which inhabit the Amazon river and the rain forest.

The exhibition gets its name, Amazonia, from the Amazon River in South America. It was created to help visitors begin to understand the complex ecosystem of the Amazonian rainforest. The first part of the exhibition recreates the Amazon river with a series of large aquarium-like tanks which hold a variety of large and small Amazonian fish, including turtles and piranhas, and which recreate the river habitat. Also on this level is a field station of the imaginary biologist, Dr. Brasil, containing smaller fish tanks, microscopes and desks for visitors to explore scientific work in the Amazon.

After the field station there are stairs which lead up to the rainforest habitat. Michael Robinson, Director, NZP, describes the rain forest habitat on the audio tour for the exhibition. Entering the rain forest habitat, he says, "is like entering a green cathedral—hot and humid and tall and majestic." The relative humidity in the rainforest habitat is 80 percent.

The rainforest habitat winds around the surface of the "river" so the visitor can see the fish below and it contains a variety of plant and animal life found in the Amazonian rain forest. The animals—including a sloth, a macaw, marmosets and, sunbitterns—roam free throughout the space. Plants are identified with short labels posted near-by and animals are identified in several laminated "field guides" placed throughout the exhibition.

Visitors walk out of the Amazonia habitat into a foyer which leads to an exit from the building and also to the entrance to the Amazonia Science Gallery. The foyer contains an exhibit comparing water levels in Brazil and Washington, DC, and a large mosaic of various types of beetles which form the shape of a beetle.

#### THE AMAZONIA SCIENCE GALLERY

The Amazonia Science Gallery, which opened in December 1996, is an 8,000 sq. ft. experimental science education/outreach center. Visitors enter the Science Gallery from the Amazonia exhibition by passing through an entry foyer where artistic representations of biodiversity are displayed. The visitor next sees the Seminar Room, a working seminar/conference room that is open to the public. The Seminar Room contains a library and many artifacts and mementos of the lives and work of research staff.

Next to the Seminar Room, visitors descend stairs to the main courtyard, a large open space with 20-foot ceiling, dominated by the GeoSphere, a 6-foot in diameter, rotating, high-resolution earth globe.

The courtyard is flanked by four labs: scanning electron microscopy, molecular genetics, behavior, and nutrition. Each lab has an office immediately outside it. Glass walls between the labs and offices can be folded back to open the space. The offices/labs areas are separated from the main courtyard by an arched facade. Interiors of the labs and offices can all be seen through the facade arches from any location in the main courtyard. The labs contain analytical equipment typical to the specific discipline as well as the usual accoutrements of any work area - papers, books, posters, and phone message notes.

The GeoSphere is supported by three multimedia interactive stations with a large library of video programs about the diversity of life on earth. The GeoSphere is also used to highlight current events in the biological sciences with a "Current Events Stickies" installation

Visitors to the Gallery have access to a changing selection of hands-on science resources. Resources include collections of objects and artifacts relating to current research projects, a microscope lab for examining animal structure, scientific literature,



computerized databases which explore the geophysical, biological, and human factors that have an impact on life on Earth, and scientific instruments ranging from a weather station and radio telemetry equipment to a scanning electron microscope.

#### BUILDING ENTRANCES AND EXITS

Visitors can only enter the Amazonia building at the entrance to the Amazonia exhibition. They have three options for exiting. They can exit just after the rainforest habitat. They can exit at the end of the Science Gallery. Finally, they have the option of retracing their steps and exiting through the main entrance.

## A GUIDE TO THIS REPORT

The report is divided into three separate sections, one for each of the studies. Each section begins with a table of contents and summary, followed by the main body of the report, and concluding with a section of final observations and addenda, where appropriate. The appendices include tables, questionnaires and information on methodology. The Table of Contents for the whole report follows:

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# OBSERVATIONS OF VISITORS IN AMAZONIA

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## Summary of Findings

The average time in the building was 17 minutes (S.D. = 9 minutes).

Dividing the audience according to the average time they spent in the building, we find that:

One quarter of visitors (mostly those without children) spent less than 10 minutes in the whole building. On average they spent about equal amounts of time stopped in the Exhibition Entrance-Main (the gallery with the fish), the Habitat, and the Science Gallery.

Another quarter of visitors spent 10 to 15 minutes in the whole building. They stopped longer on average in the Exhibition Entrance-Main than in the Habitat or the Science Gallery.

Another quarter of visitors spent an average of 15 to 20 minutes in the building. These visitors spent equal amounts of time on average stopped in the Exhibition Entrance-Main, the Habitat, and the Science Gallery.

The final quarter of visitors spent 20 minutes or more in the building. On average they spent at least twice as long stopped in the Science Gallery as in the Exhibition Entrance-Main or the Habitat.

Less than half of all visitors (45%) entered the Science Gallery.

Five percent of all visitors passed quickly through the whole building and spent an average of 1.6 minutes in the Science Gallery.

Approximately one fifth of all visitors went through the whole building, but did not spend long in the Science Gallery. They spent 3 minutes on average with the Science Gallery.

Approximately one-fifth of all visitors went through the whole building and were engaged in the Science Gallery. They spent an average of 11 minutes in the Science Gallery.

The Science Gallery held engaged visitors not only because it had more activities, but also because it provided a different kind of atmosphere (e.g., Science Gallery microscopes held visitors longer on average than microscopes in the Field Station section of the exhibition).

## Introduction

As part of the larger study of visitor experiences in the Amazonia exhibition at NZP, visitors were unobtrusively observed during their visits. A total of 139 visitors were selected for observation at the entrance to the building and their stops (locations and duration) were recorded from that point until they left the building. A "stop" was recorded if its duration was at least three seconds. In addition to behavior, several demographic characteristics were recorded by observation.

A detailed map was used for this study (see Appendix A). A total of 114 exhibition stop locations were included in the observation protocol. A stop was any distinct point at which visitors could observe biological artifacts ("real things") or communication media, such as a text panel, large photo, video loop, or interactive. The elements and sections of the exhibition were collaboratively identified by the exhibition team and the Institutional Studies Office. The purpose of identifying the locations at which visitors stopped, and the time they spent at various elements, was to collect data that would aid in understanding how and where visitors spent their time in the exhibition.

## Overall Behavior<sup>1</sup>

The 139 visitors we observed spent an average of 16.8 minutes ( $SD=9.3$  minutes) in the building ("visit time"). The median visit was 14.8 minutes; the middle 50 percent of visitors spent between 4.0 and 20.9 minutes. On average, 12.3 minutes ( $SD=8.0$  minutes) were spent viewing the exhibition ("time stopped" or "stop time") and the remaining time was spent at stops such as speaking with friends, attending to a child, or sitting on a bench (Table A.1).<sup>2</sup> Surprisingly, different social groupings spent similar periods of time in the exhibition. Figure 1 shows the distribution of visit lengths.

More than half of all visitors (53%) left the building through the exit at the Bridge after the Amazonia exhibition, (i.e., the entrance foyer to the Science Gallery), while two-fifths (43%) exited after the Amazonia Science Gallery. Six visitors (4%) exited through the building entrance, including one person who went to the Science Gallery and back through the entire building to the entrance.

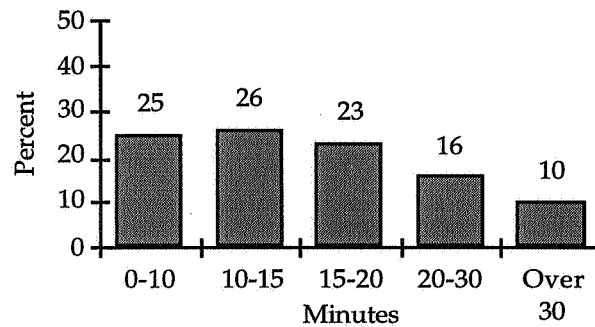
NZP visitors rarely visit alone. Of the 139 visitors tracked in Amazonia, only eight entered the exhibition alone. More than two-thirds (68%) of the Amazonia visitors entered in groups that included children (which is similar to other surveys at the NZP). In some instances, the behavior of visitors with children is very different from those without children—so it is meaningful to think of two visitor configurations, i.e., those with children and those without children.

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<sup>1</sup> The terms used in the discussion are defined on page 20.

<sup>2</sup> The tables referenced in this section are in Appendix A.

Figure 1  
Distribution of Amazonia Visit Length  
(In Percent)



Source: Appendix A, Table A.2.

As shown in Table A.1, although visitors unaccompanied by children spent slightly less time in the exhibition, the differences between visit times were not statistically significant. The same is true for the total time stopped. Overall, slightly less than three-fourths of the time in the exhibition was spent engaged with exhibition elements (70%). Social groups without children and solitary visitors were engaged for the least time. [Note, however, that some of these groups are quite small, so differences should be viewed with caution.]

Visitors made an average of 13.1 stops ( $SD=7.7$  stops) during their visit. The median number of stops was 11.0; the quarter of visitors who made the fewest stops made fewer than 8, while the top quarter made more than 17 stops. Groups including children tended to make more stops than those without children or than individuals visiting alone.

Movement through the exhibit was not always linear. Some visitors returned to see a particular exhibition element more than once. After combining their 'return' stops, the 139 visitors made a total of 1633 unique stops.<sup>4</sup>

As is apparent from the data on the average number of stops and the total stopped time, the average stop time at a specific element was one minute, (1.0 minutes,  $SD=1.3$  minutes). The median was more than half a minute (0.7 minutes). The amount of time spent at the average stop by visitor groups containing children and those not containing children was almost identical (see Table A.1).

What does a typical visitor look like? There is no single typical visitor. One quarter of the visitors (25%), those who spent less than ten minutes in the building, could be labeled *Amazonia Tasters*. The *Amazonia Tasters* contained both visitors who passed through the Science Gallery (5%) and visitors who missed it (20%).<sup>5</sup> Another third (34%)

<sup>3</sup> The tables referred to in this section are in Appendix A.

<sup>4</sup> Nearly one half (67 or 48.2%) returned to see a particular exhibition element more than once, especially in the Science Gallery.

<sup>5</sup> Fewer Tasters were accompanied by children (42.1%) than other Amazonia visitors (76.5%).

can be labeled *Science Gallery Non-visitors* since they spent more than ten minutes in the building, but never entered the Science Gallery. The remaining two-fifths were split roughly equally between *Science Gallery Browsers* (19%), who spent less than 4.5 minutes at stops in the Science Gallery, and *Science Gallery Engaged* (22%), who spent more than 4.5 minutes stopped. Thus, it may be useful to consider four distinct visitor types based on their pattern of engagement in the building rather than a single average visitor.

The average time spent increases monotonically across the four types of visitors, from *Amazonia Tasters* to *Science Gallery Engaged* visitors. (See Table A.2.) Becoming engaged in the Science Gallery substantially increased overall time visitors spent in the exhibition.

### Overall Patterns of Area Usage

Each area in the building engaged visitors to a different degree. Within the seven areas defined for this study (Exhibition Entrance-Main, Field Station, Exhibition Entrance-Other, Habitat, Bridge Room, Seminar Room, and Science Gallery), we can identify three major patterns of area usage based on the overall amount of time that a visitor spent in the Amazonia building (see Figure 2 next page and Table A.3):

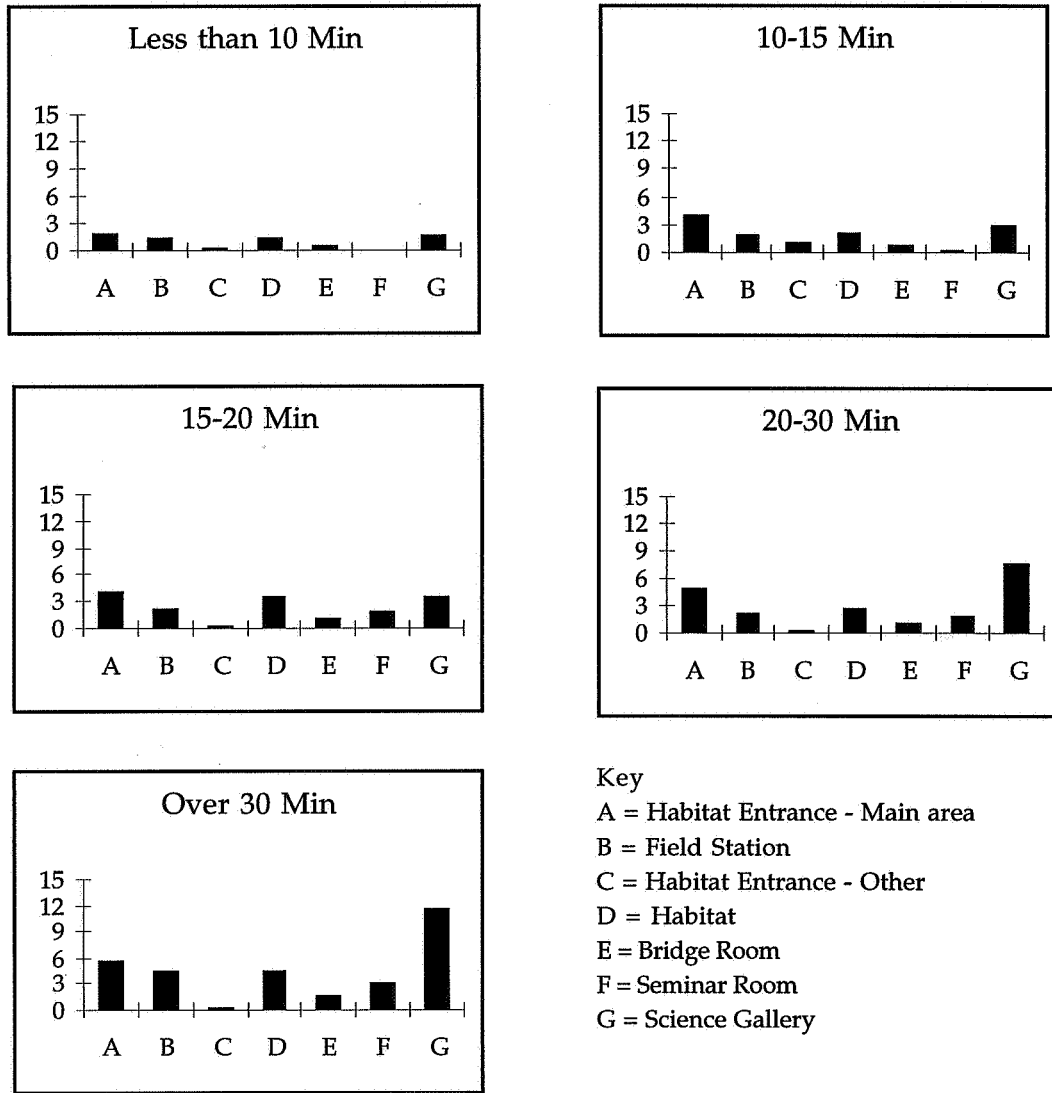
- Visitors who spent less than 10 minutes in the building as a whole moved through the exhibition at a fairly uniform rate, spending approximately equal times stopped in each of the four major galleries (Exhibition Entrance-Main, Field Station, Habitat, Bridge Room, and Science Gallery). This group of visitors contained significantly fewer children (53% without children) and more single visitors or adult couples (45%) than visitors who spent a longer time in the exhibition.
- Visitors who spent between 10 and 20 minutes in the building stopped longer, on average, in the Exhibition Entrance-Main, Habitat, and Science Gallery.
- Visitors who spent more than 20 minutes in the building spent more time on average stopped in the Science Gallery and the Field Station.

Except for the one in four visitors (25%) who spent 10 minutes or less in Amazonia, all visitors spent an average of four to five minutes stopped in the Exhibition Entrance-Main, no matter how long they spent in the building as a whole.

Those who spent more than 20 minutes in the entire building tended to stop much longer in the Science Gallery than other visitors. The longer average visit results from visitors engaging with the interactive elements in this area. While nearly half of the tracked visitors entered the Science Gallery (45%), visitors who spent more than 20 minutes in the entire building invested a larger proportion of stopped time in the Science Gallery than other visitors. Visitors who took more than 20 minutes in the building spent nearly one-third (31%) of their total stopped time in the last galleries. (See Figure 2 below.)

No matter how long visitors spent in the building, understandably they spent relatively little time in the Bridge Room or the Seminar Room, compared to the other galleries. Most visitors entered the Bridge Room (95%), however, while relatively few entered the Seminar Room (14%).

Figure 2  
Average Time Stopped/Area by Visit Length (in Minutes)\*  
(In Minutes)



Source: Appendix B, Table A.2.

**\*Notes**

- a) The title of each sub-figure indicates the total visit length category.
- b) The vertical axis is the average time stopped.



Similar conclusions can be drawn when visitors are segmented by their engagement with the Science Gallery. (See Table A.2.)

- *Amazonia Tasters*, who stopped in different building areas, spent about the same amount of time stopped in each of the major exhibition sections – 1.3 to 1.8 minutes – and spent little or no time in other areas.
- *Science Gallery Non-visitors* and *Science Gallery Browsers* spent roughly comparable amounts of time stopped in all the building areas except the Science Gallery.<sup>6</sup>
- *Science Gallery Engaged* visitors spent comparable amounts of time everywhere except the Science Gallery, where they spent 10.6 minutes on average. In other words, visitors who were engaged in the Science Gallery did not trade-off visiting time in other areas of the building to spend time in the Science Gallery.

### Exhibition Sections

Every visitor who entered Amazonia made at least one stop somewhere in the building. Different proportions of visitors made at least one stop in each of the galleries (see Table A.4):

- 98.6% in the Exhibition Entrance-Main area,
- 84.2% in the Exhibition Entrance-Field Station,
- 7.2% in the Exhibition Entrance-Other area,
- 90.6% in the Habitat,
- 58.3% in the Bridge Room,
- 12.9% in the Seminar Room, and
- 43.2% in the Science Gallery.

Within each area, the number of stops also varied.<sup>7</sup>

### Exhibition Entrance

Upon entering Amazonia, almost all visitors (98.6%) stopped at one or more of the elements in the first section, the Exhibition Entrance-Main area (Table A.4). Within this section 48.2% made more than five stops.<sup>8</sup> A total of more than half made 4, 5, or 6 stops (15.8%, 18.0%, and 19.4% respectively).

Seven elements in the entire building each accounted for over four percent of the total number of stops (Table A.5). Four of these elements were located in this section, which contained a total of 12 elements. One in twelve stops was at the “Big Fish” Tank (8.0%).

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<sup>6</sup> There is an apparent difference in the amount of time stopped in the Seminar Room, however, the number of visitors who stopped in both instances is very small.

<sup>7</sup> In addition to recording stops made at specific exhibition elements and locations, the observers also recorded general stops (e.g., tying a child’s shoe or resting and looking at non-specific art works). General stops were recorded as occurring within a area; however, such stops were excluded from the number of stops at exhibition elements within a area. For example, 139 visitors stopped within the Habitat Entrance-Main area, however, 137 stopped at exhibition elements.

<sup>8</sup> Data on file. Institutional Studies Office.

Other main stops in this section were the Entrance Pond (6.7% of stops), "Kissing Fish" Tank (6.1%), and Piranha Tank (5.3%). These four stops accounted more than one-quarter of all stops in Amazonia. The 474 unique stops in this section averaged just about the same length as stops for the entire exhibition (1.1 compared with 1.0 minutes). One in ten visitors made more than one stop at a specific location (10.2%).

### **Field Station**

Given the linear nature of the early parts of the building, visitors continued into the Field Station after leaving the Exhibition Entrance-Main area, although 15.8% did not stop at the Field Station. This section contained seven distinct elements, one of which also accounted for more than four percent of the exhibition stops: the Aquariums. About four-fifths of the visitors (84.2%) stopped at Aquariums, which accounted for 59.1% of stops in the Field Station. The next most popular exhibition element was the Microscopes with 29.5% of visitors stopping. The average length of stop in the Field Station was 1.2 minutes. Half of the visitors who stopped in the Field Station made only one stop (48.7%).

### **Habitat**

Almost all of the visitors next entered the Habitat section (97%). They almost certainly made a stop (93.3%) and 19.0% returned to a stop location after leaving it. Two-thirds made more than three stops (61.9%). Four locations predominated among the stops in the Habitat: Fence 1 (71.2% of visitors in this section stopped there), Fence 3 (51.1% stopping), Fence 2 (46.0%), Fence 4 (46.0%) and the Root Tree (31.7%). Together, these five elements accounted for 68.8% of all stops in the section and 20.9% of all exhibition stops. Only the Fence 1 (6.1%) and Fence 3 (4.3%) locations accounted for more than four percent of exhibition stops even though the other two fence locations were very close at 3.9%. The average length of stop at these locations ranged from 0.86 minutes to 0.65 minutes

### **Bridge and Seminar Rooms**

The preponderance of the tracked visitors entered the Bridge Room (95%) and a majority made at least one stop in the section (58.3%). Four-fifths of the visitors who stopped (81.5%) made one or two stops, with an average stop lasting 0.75 minutes. Since the most popular stop, by a wide margin, was the Beetle Display, it is not surprising that the average stop time at the Beetle Display was 0.79 minutes. This element accounted for only 3.9% of exhibition stops, but 61.2% of stops in the section.

The Seminar Room is located adjacent to the Bridge Room. Relatively few tracked visitors (14%) entered the Seminar Room, even though 95% entered the general area. Almost all visitors who entered this room made at least one stop. The Center Table was the single most popular location. An average visitor in the Seminar Room spent 1.3 minutes at stops.

## Science Gallery

The final area in Amazonia is the Science Gallery. It consists of a central area with four laboratories along the walls. Each laboratory is devoted to a single subject: biodiversity, molecular genetics, behavior, and nutrition. Since 53% of visitors exited at the Bridge gallery, fewer tracked visitors (45%) entered the Science Gallery. Of those, 95.2% made at least one stop. The visitors who elected to spend time in this area, spent longer periods stopped (average stopped time was 1.72 minutes) than visitors in any other area of the building. More than half (55.0%) made more than three stops in the Science Gallery. More than a quarter moved from one element to another element and then back again (26.7%). All of these statistics add up to the fact that Science Gallery visitors, on the average, spent more time in Amazonia than those who passed through or exited at the Bridge and they were more engaged by these exhibition elements. Since fewer visitors entered this section, no single element accounted for more than two percent of all building stops. Only the Geosphere, where a fifth of the visitors stopped (20.1%) and the Biodiversity Microscopes accounted for more than 1% of all stops

Nearly one-sixth (17.9%) of all visitors stopped at one or more of the three GeoSphere computers (9.4% at computer 1, 11.5% at computer 2, and 6.5% at computer 3). About a sixth of the visitors (17.3%) stopped at the Biodiversity Microscopes, the single most popular element in the four laboratories in the Science Gallery. The Tarantula Terrarium was also a popular element. One out of eight visitors (12.3%) stopped there. Few visitors stopped in the Genetics Laboratory. Even fewer visitors stopped in the Behavior Laboratory, and virtually no visitors stopped in the Nutrition Laboratory.

## Artwork

A number of artworks are scattered throughout the building. One quarter of the Amazonia visitors (32 visitors or 23%) made a stop at some piece of artwork with the average stop lasting half a minute. Several visitors (11) made more than one stop at the artworks.

## Final Observations

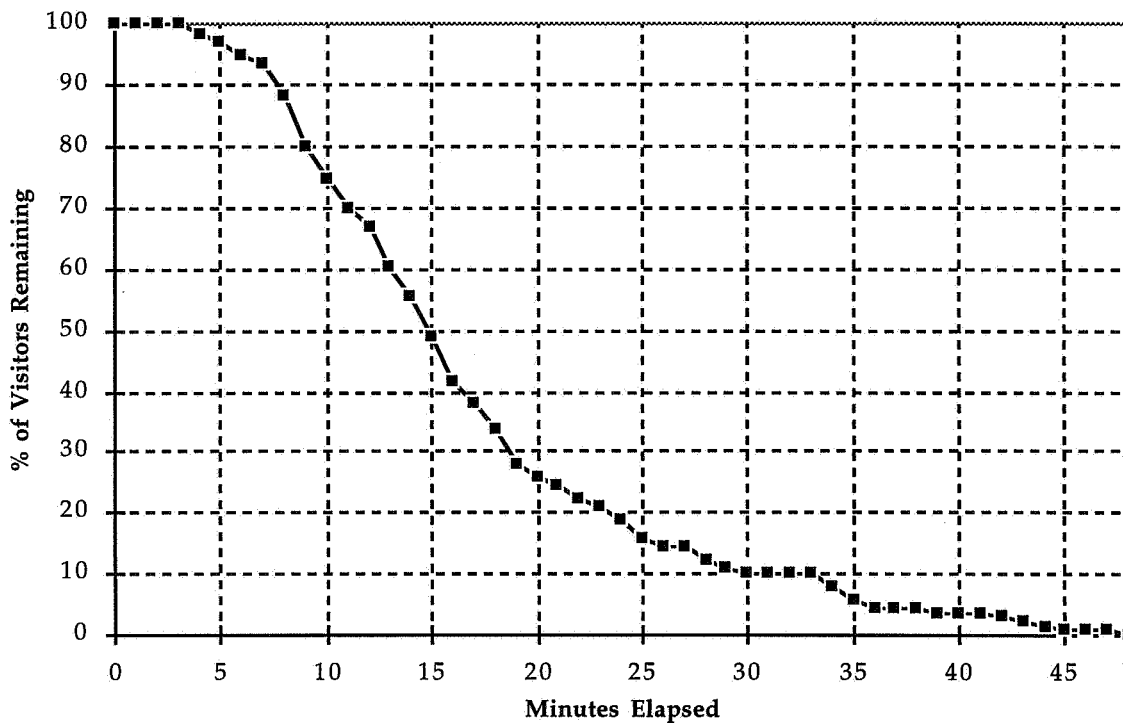
Most visitors who entered Amazonia took time to stop and look at the exhibition. One-quarter remained for less than ten minutes. They passed through with fewer stops and spent about the same amount of time in each area. This group tended to be adults unaccompanied by children. Another two-thirds of visitors spend 10 to 30 minutes in the exhibition and were more involved with the exhibition elements. Finally, one-tenth were engaged for more than 30 minutes. They tended to spend a larger percentage of their visit in the Science Gallery.

Nearly half of the visitors (45%) entered the Science Gallery. About one-fifth of the visitors who were tracked became actively engaged in the Science Gallery—that is, they spent more than 4.5 minutes at stops there. Another fifth of the visitors entered the Science Gallery but were relatively unengaged. In other words, one-half of visitors who entered the Science Gallery were engaged and the other half were just browsing. Although no scientists were scheduled to work in the Science Gallery laboratories during the period of tracking, six visitors were observed talking to Amazonia staff—not necessarily a scientist. One of the six interactions occurred in the Science Gallery.

Clearly, fish were the most popular single attraction in Amazonia. Four of the six most popular exhibition elements involve fish. Groups with children spent relatively more time engaged with the fish exhibits than groups without children.

The popularity of the fish contributed to the fact that the number of visitors remaining in Amazonia is close to 100% for several minutes (see Figure 3 on the next page). Almost everyone spends some time with these elements. The decay curve slopes downward after five minutes, but levels out again after 30 minutes. This tail reflects visitors who become engaged with certain exhibition elements, such as those in the Science Gallery, for a relatively long period.

Figure 3  
Percent of Visitors Remaining in Building by Minutes Elapsed from Entry



## Definitions

- Visit Time.** We have defined "visit time" as the total time in the exhibition; i.e., "visit time" includes time observing, time waiting to see an object, and time spent in other activities (e.g., tending to a child). The median visit time in the building is 14.8 minutes; i.e., half of the visitors spend more than 14.8 minutes and half less than 14.8 minutes.
- Time Stopped.** A "stop" is defined as a minimum of 3 seconds in which the visitor is standing still and is clearly observed looking at an object or engaged in an exhibition-related activity (e.g., reading text, using an interactive, etc.). "Time Stopped," therefore excludes waiting in line, walking through an area, etc. The average time stopped in the building is 12.3 minutes (S. D. = 8.0 minutes).
- Percent Engaged.** The relationship between "visit time" and "stop time" can be expressed as the percentage of time in the exhibition during which the visitor is directly engaged with the materials that are presented.
- Number of Stops.** The total "number of stops" made by a visitor in the exhibition, including repeat stops to a specific element. For example, a visitor who stops at element A, continues and stops at element B, and returns to element A is considered to have made 3 stops. Using this definition, we find that, on average, visitors make a total of 13.1 stops (S. D. = 7.7). The median number of stops is 11.0.
- Unique Stops** Our observation forms identified a total of 114 possible unique stops in the exhibition. If we exclude 'return stops,' we have 'unique stops.' For example, a visitor who stops at element A, continues and stops at element B, and returns to element A is considered to have made 2 unique stops.

# A SURVEY OF ENTERING AND EXITING VISITORS

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## Summary of Findings

The analysis shows that visitors who exited through the Science Gallery have different opinions about science, nature, and scientists from visitors who exited before entering the Science Gallery, although the exiting groups had similar demographic characteristics. Science Gallery visitors also reported a wider variety of satisfying experiences than visitors who exited before the Gallery.

**VIEWS OF SCIENCE AND NATURE** Our major finding is that the Science Gallery influenced many Science Gallery visitors to change their opinion about the ability of most people to understand the basic ideas of science. Science Gallery visitors are much less likely to agree that "the basic ideas of science are too complex for most people to understand," compared to visitors who exit after the Amazonia exhibition. Whereas 49 percent of exiting visitors who saw only the exhibition agreed with the statement, only 26 percent of visitors who saw the Science Gallery agreed with it.

All visitors left the building somewhat less likely to agree that taming the wild is a sign of progress compared to entering visitors (26% exhibition exit, 21% Science Gallery exit, and 32% entering visitors).

Two-thirds (68%) of Science Gallery visitors said that they thought their visit will influence the way they think about biological research. Similarly, 59 percent of Amazonia exhibition-only visitors said that they thought their visit will influence the way they think about rainforests.

**SATISFACTION** Visitors who spent time in the Science Gallery reported a wider range of satisfying experiences, compared to those entering the building and those leaving after the exhibition. The predominant satisfying experience elsewhere at the zoo and in the habitat was the social experience, i.e., spending time with friends or family.

## Introduction

This section presents the results from the survey of visitors conducted at the Amazonia exhibition and the Amazonia Science Gallery. During a two-week survey period, August 10 to August 22, 1998, we intercepted visitors: (a) who entered the Amazonia building; (b) who left the building after viewing the Amazonia exhibition but who did not enter the Science Gallery; and (c) who left the building after visiting both the Amazonia exhibition and the Science Gallery.<sup>9</sup> In addition to their presence while conducting normal building activities, NZP researchers were scheduled to work in the Science Gallery's research labs and to be accessible to visitors during some of the data collection periods. (Researchers generally are not required to be in the Science Gallery at specific times).

The different interviewing locations – entrance, exhibition exit and Science Gallery exit – allowed us to describe visitors and compare their characteristics, attitudes and opinions at different exit points. The main objectives of the study are described below:

- Provide information about Amazonia visitors – the context of their visit and their demographic characteristics.
- Assess possible differences in opinions about rain forests, biological research, science and scientists, the work of professional staff at NZP, and satisfying experiences, between visitors who exit the building after viewing only the Amazonia exhibition and those who exit after also visiting the Science Gallery.

The results are presented in the order of these objectives.

## The Visit Context

Visitors come to the Amazonia building with different levels of prior experience at science- and nature-oriented exhibits. We asked visitors a series of questions to determine their past experience with NZP, Amazonia, the Smithsonian's National Museum of Natural History (NMNH) and with other exhibitions about rain forests.

This section presents the major questions we asked and visitor responses. We note any significant differences among the three locations— entrance, exhibition exit and Science Gallery exit.

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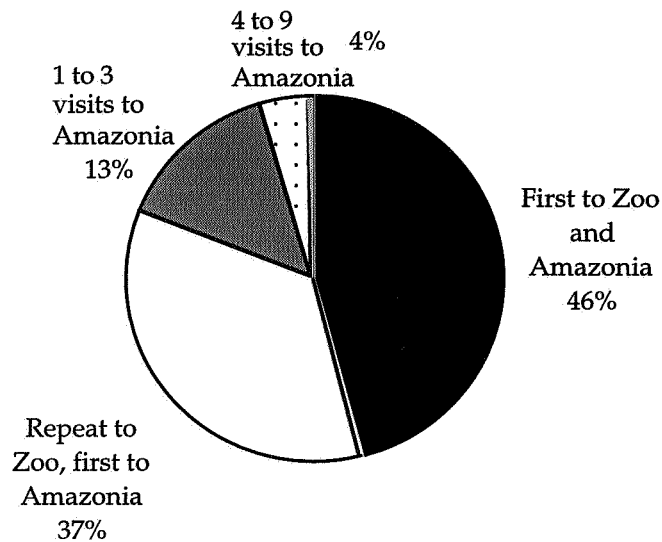
<sup>9</sup>Visitors to both the exhibition and the Science Gallery use a common entrance, located at the entrance to the Amazonia exhibition. A visitor enters the Science Gallery by exiting the exhibition and crossing a connecting hallway or "bridge." Visitors who decide not to enter the Science Gallery can leave the building at the bridge. Visitors who enter the Science Gallery can exit the building either by returning to the bridge, to the entrance, or, more commonly, using a Science Gallery exit.



**Is today your first visit to this zoo?**

- Slightly over half (54%) of all Amazonia visitors had been to NZP sometime in the past — 46% were making their first visit to NZP.
- About one in five visitors (22%) had been to NZP at least once in the last year, i.e., since August 1997. Most of these visitors live locally.
- About one in six visitors (17%) was making a repeat visit to Amazonia.

**Figure 1.**  
**Frequency of Visits to Amazonia, Combined Total**  
**(In Percent)**



- Three out of four visitors (77%) decided to visit the Amazonia building only after they arrived at NZP. One in four (23%) made a decision to visit Amazonia before they arrived at NZP. Science Gallery visitors were about 6% more likely than Amazonia exhibition-only visitors to have made their decision to visit the building before they arrived.

**Have you ever visited the Smithsonian's National Museum of Natural History?**

- Almost three-fourths (73%) of Amazonia visitors had also visited NMNH sometime in the past. About one-fourth (27%) had visited NMNH four or more times in the past.

**Have you ever visited another exhibit about rain forests?**

- A majority of Amazonia visitors (60%) had been to another rainforest exhibit in the past; in addition, 4% had been to a real rainforest.

## Did you notice any scientists working in a lab?

- On days when scientists were scheduled to be in the Science Gallery labs, 88% of visitors noticed a scientist in the building – mostly in the Science Gallery (82%). On unscheduled days, 22% of visitors noticed a scientist in the building. About 8% of all visitors (or 10 people) talked to a scientist – mostly in the Science Gallery (six out of ten respondents).

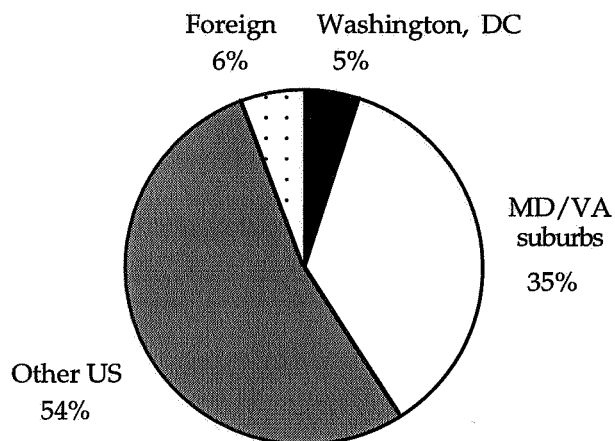
## Visitor Demographic Characteristics

This section presents the basic demographic characteristics of Amazonia visitors (residence, race/ethnicity, gender, age, social group, education and, scientific or technical training). Again, we note where there were differences between the survey locations.<sup>10</sup>

### RESIDENCE

Just over half of Amazonia visitors (54%) lived in the United States outside of the Washington, DC Metropolitan Area; About a third (35%) lived in the Washington, DC suburbs; 5% lived in Washington, DC and 6% lived in foreign countries.

Figure 2  
Residence of Amazonia Visitors, Combined Total  
(In Percent)



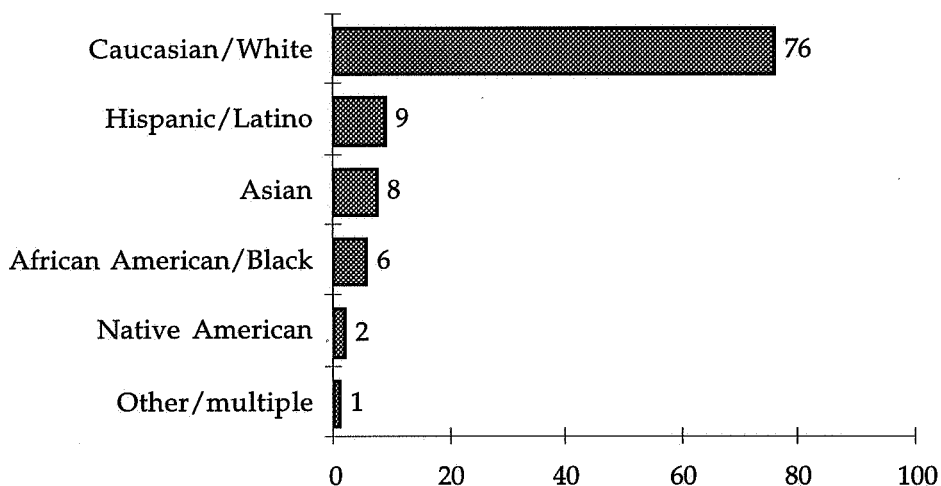
### RACE/ETHNICITY

One in four of Amazonia's U.S. visitors (24%) identified themselves with a minority racial/ethnic group. Three in four (76%) identified themselves as white/Caucasian.

<sup>10</sup> The demographic characteristics of Amazonia visitors parallel the demographic characteristics of visitors interviewed during the study of visitors to Think Tank in the August 1996.

Hispanic American visitors were the largest minority group (9%) followed by Asian American visitors (8%) and African American visitors (6%)<sup>11</sup>.

Figure 3  
Race/ethnicity of Amazonia Visitors, Combined Total  
(In Percent)



**GENDER** Slightly more women (54%) than men (46%) visited Amazonia during the survey period.

More women than men visited the Science Gallery (60% women and 40% men) and more men than women exited after the Amazonia exhibition (37% women and 63% men).

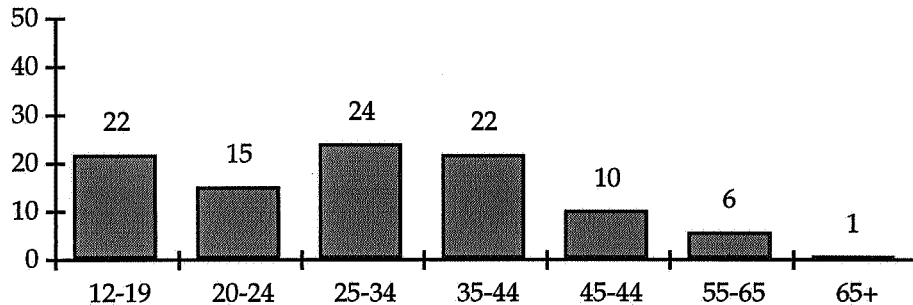
**AGE** The largest age grouping of Amazonia visitors was between the ages of 25 and 44 (46%) followed by those under age 25 (37%). Figure 4 shows a more detailed breakdown of age groups for visitors age 12 and over. (See Figure 4, next page.)

**SOCIAL GROUP** The majority of visitors (58%) came to Amazonia in a social group of adults and children. Just over a quarter (26%) visited with one other adult (a pair) and few visitors came alone (6%).

**EDUCATION** Over half of Amazonia adult visitors, age 25 or older, had attained a Bachelor's degree or higher (58%) and one quarter (24%) had earned an Associate's degree or had some college enrollment.

<sup>11</sup> Most Hispanic/Latino visitors live outside of the Washington, DC Metropolitan. Just under 10% live in the District and about one-fourth live in the Maryland or Virginia suburbs. Most Hispanic/Latino visitors were making their first visit to the zoo (71%).

Figure 4  
Age of Amazonia Visitors, Combined Total  
Age 12 and Over  
(In Percent)



SCIENTIFIC OR  
TECHNICAL  
TRAINING

Most visitors (70%) did not have scientific or technical training, nor did anyone in their family.

Three of ten (30%) visitors worked in – or had a family member who worked in – the medical field (nursing, pharmaceutical), engineering, computers or had taken some academic courses in the physical sciences.

Visitors who had scientific or technical training or who had a family member who had scientific or technical training were more common in the Science Gallery (35%) than at the Amazonia exhibition exit (26%).

Very few visitors were employed in a natural science or engineering field (7%). Another handful were college or grade-school teachers (8%) or health professionals (6%).

## Attitudes and Opinions

This section looks at visitors' views of science, nature, scientists and scientific research and satisfying experiences in the Amazonia building. We also look at whether visitors report that the exhibition will influence the way they think about the specific exhibition topics – rainforests, biological research, and the work of NZP professionals.

### Visitors' Views of Science and Nature

We asked visitors to tell us whether they strongly agreed, agreed, disagreed or strongly disagreed with each of six statements about science and nature. Since many people did not strongly agree or strongly disagree with many statements, we combined those categories with “agree” and “disagree” respectively. Visitors who went to the Science Gallery were more likely to have opinions that we characterized as “pro-science and pro-nature” than visitors who did not experience the Science Gallery.

#### SCIENCE GALLERY EFFECT

The most striking difference in the opinions of visitors who visited only the Amazonia exhibition and those who also visited the Science Gallery is that Science Gallery visitors are much less likely to think that the basic ideas of science are too complex to understand than visitors who exit right after the Amazonia exhibition and visitors entering the building. This result suggests that the Science Gallery helped half of the Science Gallery visitors who came in with the idea that the basic ideas are too complex to change their opinion and to agree that the basic ideas of science are NOT too complex for most people to understand (i.e., from 49% to 26%).

<u>Statement</u>	<u>% of Respondents who Agree</u>		
	<u>Entrance</u>	<u>Amazonia Exit</u>	<u>Science Gallery</u>
The basic ideas of science are too complex for most people to understand.	49%	49%	26%

#### EXHIBITION EFFECT

Visitors clearly had a different opinion about one statement after experiencing the Amazonia exhibition. At both exit locations, the percentages of exiting visitors who agreed with the following statement is significantly lower than that of entering visitors.

<u>Statement</u>	<u>% of Respondents who Agree</u>		
	<u>Entrance</u>	<u>Amazonia Exit</u>	<u>Science Gallery</u>
Taming the wild is a sign of progress.	32%	26%	21%

## UNCERTAIN CAUSE

Compared to entering visitors, Amazonia exhibition exit visitors were less likely and Science Gallery exit visitors were more likely to agree that most scientists want to make the world a better place.

<u>Statement</u>	% of Respondents who Agree		
	<u>Entrance</u>	<u>Amazonia Exit</u>	<u>Science Gallery</u>
Most scientists want to work on things that will make the world a better place.	85%	75%	90%

It is impossible to determine from this study how much of these differences between entrance and the two exits might represent the effect of the galleries and how much might reflect some unknown dissimilarity between those who left directly after the exhibition and those who went on to the Science Gallery.

Another response that shows variation between interview locations was the percentage who agreed with the statement that *Intelligence is the best measure of how valuable a species is*. Compared to entering visitors, those who only see the exhibition are more likely to agree and those who visit the Science Gallery are less likely to agree. Once again we cannot tell how much of this variation might represent differences between those who entered the Science Gallery and those who did not and how much of it might derive from dissimilar effects of the Exhibition and the Science Gallery.

<u>Statement</u>	% of Respondents who Agree		
	<u>Entrance</u>	<u>Amazonia Exit</u>	<u>Science Gallery</u>
Intelligence is the best measure of how valuable a species is.	32%	44%	23%

## NO CHANGE IN OPINION

Exiting visitors did not show any significant difference from entering visitors in their opinions about the following two statements.

<u>Statement</u>	% of Respondents who Agree		
	<u>Entrance</u>	<u>Amazonia Exit</u>	<u>Science Gallery</u>
Human beings are the most important living things on earth.	54%	48%	56%
The benefits of scientific research have outweighed the harmful results.	61%	57%	66%

## What are three words that you would use to describe scientists?<sup>12</sup>

In answering this question, visitors used many different words. We aggregated similar words and ideas and found that eleven major themes or concepts underlie the descriptions. (See Table 1).<sup>13</sup>

Four of the themes related to positive personal characteristics of scientists (intelligent, curious, interesting, caring). Three other positive descriptive categories related to the way scientists approached their work (dedicated, methodical, creative). Some visitors described the role of scientists as "valuable," while a few described them, in a neutral fashion, as "naturalists."

Among positive descriptions were:

### Personal characteristics

- Intelligent (e.g., smart, educated, intellectual)
- Curious (e.g., inquisitive, exploring)
- Interesting (e.g., awesome, cool, intriguing)
- Caring (e.g., concerned, compassionate)

### Approach to tasks

- Dedicated (e.g., love job, work hard, committed)
- Methodical (e.g., analytical, logical, empirical, experimental)
- Creative (e.g., innovative, resourceful)

### Social role

- Valuable (e.g., beneficial, good, useful, necessary)

Some respondents used negative words to describe scientists, such as "bad," "nerds," "dangerous," or "harmful."

Amazonia visitors also used words that represented neutral descriptions, such as:

- Physical description (e.g., safari hat, backpack)
- Naturalist

Finally, some Amazonia visitors used miscellaneous words that could not be easily allocated to the eleven major themes, but did not convey any negative affect towards scientists (Other).

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<sup>12</sup> Respondents were also asked to describe scientific research. Fewer visitors provided descriptions of scientific research than science. Visitors exiting before the Science Gallery were less likely to provide any descriptive words for "scientific research" (40%) than visitors exiting after the Science Gallery (67%) or those entering the Amazonia building (60%).

<sup>13</sup> Three-quarters of the survey respondents provided descriptions of a "scientist" (76%). The discussion in this section is based on visitors who responded and provided descriptive words.

Table 1  
Themes or Concepts Used to Describe "Scientists"  
 [In Percent of Visitors who Responded to the Question]

Theme or Concept	Building Entrance*	Science Gallery*
Positive Personal Characteristics		
Intelligent (e.g., smart, educated, intellectual)	75	59
Curious (e.g., inquisitive, exploring)	32	34
Interesting (e.g., awesome, cool. Intriguing)	9	11
Caring (e.g., concerned, compassionate)	9	10
Positive Approach to Tasks		
Dedicated (e.g., love job, work hard, committed)	24	32
Methodical (e.g., analytical, logical, empirical)	24	37
Creative (e.g., innovative, resourceful)	7	9
Positive Social Role		
Valuable (e.g., beneficial, good, useful, necessary)	26	33
Physical Description		
Physical characteristics (e.g., safari hat, backpack)	12	8
Naturalist	5	4
Negative (e.g., bad, nerds, dangerous, harmful)	16	19
Other	8	8

\*Total equals more than 100%, as respondents were asked to provide three words.

The most common theme used by either visitors entering the building or exiting through the Science Gallery characterized scientists as "intelligent," "smart," or "educated" (Intelligent). Three-quarters of entering visitors and nearly three-fifths of exiting visitors who answered this question referred to scientists as "intelligent." Next most common were descriptions of scientists as "curious," "valuable," "dedicated," and "methodical." The most frequent descriptions all are positive characterizations. Fewer than one out of five respondents who answered the question (25% did not answer) gave a negative characterization of scientists, such as "bad," "weird," "egotistical," or "harmful."

In general, with minor exceptions, visitors at the two locations provided similar descriptions of scientists. Visitors exiting from the Science Gallery described scientists as "intelligent" less frequently than entering visitors (59% exiting compared with 75% entering). However, these differences are offset by increases in the frequency of descriptions such as "valuable," "dedicated" and "methodical." Effectively, visitors exiting through the Science Gallery placed less weight on personal characteristics and more weight on professional characteristics. [None of the other themes, including "Other," varied by more than four percent between entrance and Science Gallery exit, well within the range of sampling error.]

The Amazonia visitors entered, and left, the building with primarily positive conceptions of scientists or neutral physical-characteristic conceptions. Half of



Amazonia visitors interviewed entering the building or exiting through the Science Gallery exclusively mentioned positive themes only (52% for each sample) (see Table 2).

Table 2  
Combination of Themes or Concepts Used to Describe "Scientists"  
 [In Percent of All Visitors]

Combination of Themes	Building Entrance*	Science Gallery
Positive only	52	52
Positive and negative	12	14
Positive and physical description	12	9
Positive, negative and physical description	1	0
Negative only	0	0
Negative and physical description	0	0
Physical description only	0	0
No words provided by visitor	24	25
Total %	101	100

\*Total equals more than 100% due to rounding.

About one in eight visitors (12% of entering visitors and 14% of exiting visitors) provided words that combined positive and negative descriptions. Slightly fewer, about one in ten visitors, combined a positive description with a physical-characteristic description (12% of entering visitors and 9% of exiting visitors). One-quarter of entering and exiting visitors were unable or reluctant to provide any descriptive words. Amazonia visitors did not provide any other combination of descriptions.

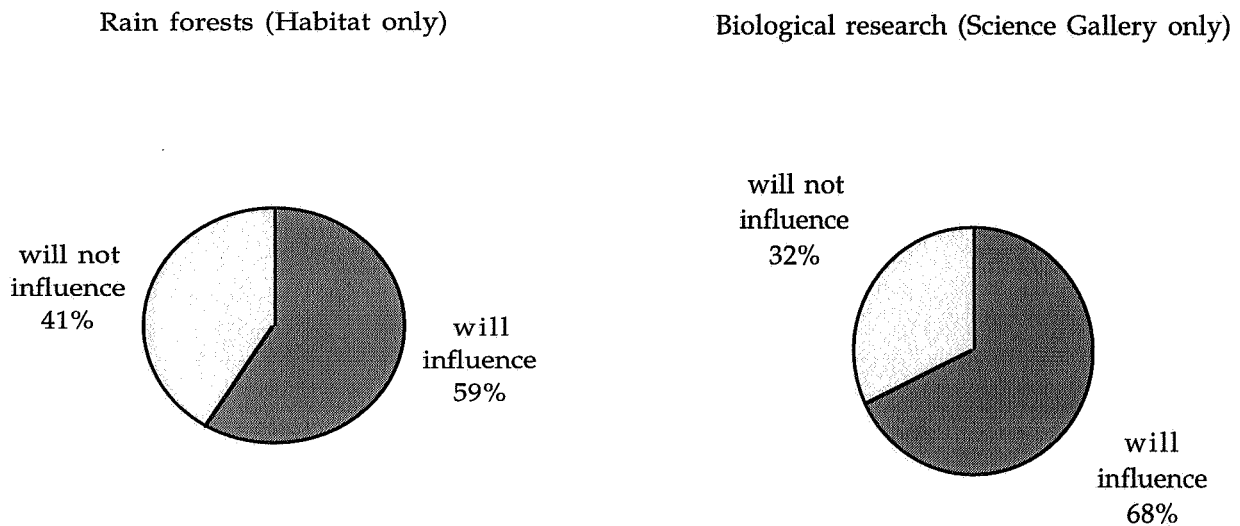
Visitors with children were significantly more likely to mention "intelligent" (77%) than those without children (57%). They were also more likely to describe scientists as "curious" (33%) than other visitors (18%). Visitors, 25 years old or older, with a college degree were more likely to describe scientists as "dedicated" (40%) than visitors with less education (28%). Visitors who said that they noticed scientists in the Amazonia building, described scientists as "methodical" (38%) more frequently than visitors who did not notice any scientists (17%). The fifth of the Amazonia building visitors who had previously visited the exhibit two times or more were significantly more likely to describe scientists as "dedicated" (47%) than other visitors. They were also unlikely to use a "physical characteristic" description (2%). Finally, visitors with technical or scientific training were more likely to describe scientists as "dedicated" (41%) in comparison with other visitors (26%).

## Do you think this exhibition will influence the way you think about rainforests/biological research?

Aside from their current opinions about science and nature, we asked visitors to think about whether Amazonia would influence their future thinking. Visitors who exited after the Amazonia exhibition were asked if they felt that the exhibition will influence their thinking about rainforests. Visitors who exited through the Science Gallery were asked if the exhibition would influence their thinking about biological research. For both questions, the majority of visitors said that their visit to the Amazonia building would influence the way they think about rainforests (59% Amazonia-only visitors) and biological research (68% Science Gallery).

Visitors who were experiencing Amazonia for the first time were more likely to report that they would be influenced by their visit to the Amazonia exhibition than repeat visitors. First-time Amazonia visitors said the way they think about rainforests would be influenced by the Amazonia exhibition twice as often as repeat visitors (88% first-time versus 44% repeat). Repeat visitors, presumably, have already had the opportunity to be influenced by the exhibition, so it is less likely that they would be influenced differently on a repeat visit.

Figure 5.  
Percent of visitors who said Amazonia would influence the way they think about rainforests or biological research  
(In Percent)



**Many professional people work behind-the-scenes at the Zoo. What do you think these people do?**

In order to understand how much people know about the research and other work going on at NZP, we told visitors that many professional people work behind-the-scenes at NZP and asked them what they thought these people did. The varied responses were aggregated into 10 categories by the interviewers.

Most visitors (about three-quarters at each location) mentioned daily animal care as work that goes on behind-the-scenes at NZP (Table 3). Daily care responses ranged from feeding the animals and keeping them healthy to cleaning their living spaces. Visitors leaving from both exits were slightly less likely than entering visitors to mention daily animal care as the only activity they could think of for NZP professionals. (Daily animal care was the only response mentioned by 13% at the Amazonia exit, 14% at the Science Gallery and 23% at the Entrance).

Visitors also provided several other activities, in addition to daily animal care, that they thought NZP professionals do behind-the-scenes. Science Gallery visitors gave more multiple responses and more varied responses compared to entering visitors and exhibition-only visitors. About two-thirds of entering visitors and exhibition-only visitors gave two or more responses while four-fifths of Science Gallery visitors gave two or more responses. About 15% of Science Gallery visitors gave four or more responses compared to 12% of entering visitors and 9% of exhibition-only visitors.

Table 3  
What Amazonia visitors' think zoo professionals do behind-the-scenes,  
by location  
(In Percent of Visitors)

	Building Exit	Amazonia Exit	Science Gallery
Daily animal care	75	71	80
Exhibition development	18	20	21
Education/public programs	14	10	5
Admin. Operations	3	3	4
Animal acquisition	3	8	4
Research areas:			
Animals (other)	27	15	24
General	23	18	13
Endangered species	17	18	15
Environment	7	19	31
Other	9	6	9
Don't Know	3	3	4

Three factors -- visiting Amazonia on the day of the interview, having visited Amazonia and NZP previously, and age group -- each influenced visitors' knowledge about the research and work that goes on at NZP.

- A visit to the Amazonia building increases visitors' awareness about environmental research at NZP. Exiting visitors at both locations were more likely than entering visitors to mention environmental research (19% for exhibition-only visitors, 31% for Science Gallery visitors versus 7% for entering visitors).
- As we might expect, visitors who had been to Amazonia before and those who had been to NZP four or more times in the past had more ideas about what zoo professionals do than visitors who were less familiar with Amazonia and NZP. Frequent NZP visitors (4+ visits) mentioned education (20% versus 5% for visitors who had been to NZP less than four times), administration and operations (22% versus 15% for visitors who had been to NZP less than four times) and exhibition development (34% versus 14% for visitors who had been to NZP less than four times) more often than first-time and less frequent visitors.
- Younger visitors were less likely to mention research on endangered species. If we look at entering visitors, those ages 25 to 44 were the least likely age group to mention research on endangered species (11%). Visitors ages 45 and older mentioned research on endangered species most frequently (36%), followed by visitors under age 25 (16%).

### **What do you expect to see or do in this building today?**

Visitors entering the Amazonia building were asked to describe what they expected to see or do in the building. The vast majority of visitors mentioned a single expectation (82%), while fewer than 2% mentioned three expectations. No visitor mentioned more than three expectations.

Nearly half of the visitors said that they expected to see animals in Amazonia (44%), while a third expected to see a rainforest habitat (31%). More visitors mentioned "see animals" alone (29%) than "see a rain forest habitat" alone (16%). About one in seven visitors expected to see both animals and a rain forest habitat (15%). Small percentages talked about seeing animals fed (2%) or reading text (1%), although these visitors also expected to see animals or a rain forest habitat. No survey respondent indicated, during an entrance interview, that they expected to see scientists or use scientific instruments. Nearly two-fifths said that they did not know what they would do or see inside Amazonia (39%).

## What did you find most interesting in this building?

This section describes which areas and experiences visitors thought were most interesting in the Amazonia building. We also compare the kinds of experiences that exiting visitors found most satisfying during their visit with some of the experiences entering visitors found most satisfying in other parts of NZP.

The fish and the rain forest were by far the most interesting parts of the Amazonia visit for all visitors.

- Four out of ten visitors said the fish (41%) were most interesting.
- Three out of ten mentioned the rainforest (30%) as most interesting.
- The remaining 29% were divided among 13 other animals and exhibit components – Science Gallery/reading area, beetle display, computer activities, variety of life, birds, frogs, plants, hands-on (not computer), labs, monkeys, microscopes, animals in general, and other.

Visitors who went to the Science Gallery were also interested in computers and the variety of life they saw in Amazonia and the Science Gallery in addition to the fish and the rainforests.

Most visitors were drawn to the fish because they were so large. Visitors also enjoyed being able to get close to the animals and plants and the "it seems real" quality of the exhibition.

## Which of these experiences comes closest to describing your most satisfying experience in the Zoo/Amazonia today?

Our previous work has shown that visitors vary in the types of experiences that they find satisfying. Amazonia building visitors were asked to select their most satisfying experience from a list of types of experiences printed on a card.<sup>14</sup> Entering visitors were asked about their most satisfying type of experience in the NZP before entering the building, and exiting visitors were asked to about their most satisfying experience in the building (see Table 4).

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<sup>14</sup> The Amazonia visitors were asked to choose their most satisfying experience, and two additional experiences, from a list of 14 choices. During analysis, we concluded that the list contained both types of experiences and types of activities. The types of activities included: (1) I saw unusual fish; (2) I engaged in science activities; (3) I saw animals in a natural habitat; (4) I saw interesting plants. These four activities and "other" were deleted from this present analysis. The data set was recoded so that only experiences were included in the data analysis rather than both experiences and activities. For example, if a respondent gave "I saw unusual fish" as her most satisfying experience and "I was moved by beauty" as her second, the present analysis is based on treating "I was moved by beauty" as her most satisfying experience.

Table 4  
Most Satisfying Experience  
(In Percent of Visitors who Responded to the Question )

	Building Exit	Amazonia Exit	Science Gallery
I spent time with family and/or friends	34	31	14
I saw my children learning new things	17	21	15
I felt a connection with the natural world	17	15	10
I enriched my knowledge	15	14	14
I was moved by beauty	8	7	12
I recalled travels, childhood or other memories	7	3	12
I thought about how precious life is	2	7	13
I imagined other times or places	0	1	8
I felt a spiritual connection	<u>0</u>	<u>0</u>	<u>2</u>
Total	100	99	100

Entering visitors showed the same patterns of satisfying experiences with respect to other places in the zoo that visitors exiting after the Amazonia exhibition showed with respect to the Amazonia exhibition. About a third of each group said that time spent with friends and/or family was their most satisfying experience. Smaller percentages (between 14% and 21%) reported being most satisfied with seeing children learning, connecting with the natural world, and enriching their knowledge.

Contrary to the similarity between visitors exiting after the exhibition and general zoo visitors, Science Gallery exit visitors reported a very different distribution of satisfying experiences. A smaller percentage of Science Gallery visitors mention time spent with friends/family as their most satisfying experience (14%). While this percentage is lower, Science Gallery visitors apparently experienced a broader range of satisfying experiences, as shown by the relatively uniform distribution of responses across seven types of satisfaction (percentages range between 10% and 15%). Science Gallery visitors were slightly less likely to report that their main satisfaction was seeing their children learning new things, feeling a connection with the natural world, or enriching their knowledge than other visitors interviewed. They were more likely than other visitors to report the following satisfying experiences: (1) thinking about how precious life is; (2) being moved by beauty; (3) recalling travels, childhood experiences, or other memories; and (4) imagining other places and times.

# INTERVIEWS WITH SELECTED FAMILIES

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## Summary of Findings

This study investigated the experiences of 12 family groups who were engaged in using the Amazonia Science Gallery. Five of these stories are detailed in the report. They demonstrate the richness and complexity of the interactions between visitors and the Science Gallery.

### A Type of Community

In a number of ways the Science Gallery functions for these visitors as a type of free-flowing community with the following attributes:

- it is a “safe haven” where visitors can let down their guard
- it encourages experimentation, play, and social contact
- it has rules for quiet and decorum
- it allows thoughtful, private experiences
- it is suitable for different learning agendas and parenting styles

These attributes are signaled by:

- the architectural ambience of the space
- temperature and sound levels in the space
- “Quiet” signs in the bridging area
- the types of stations that are visible
- variable seating
- the absence of crowds

These visitors scanned these conditions and determined whether or not they suited them. Family groups that chose to spend time in the Science Gallery were:

- experienced in visiting science museums
- especially committed to learning
- strongly interested in animals or science
- lived near enough that they could visit regularly

The decision to enter was made by the parent in some cases and by the child in others. A few parents were reluctant because they were afraid that this space was not public or would require too much restraint. A few younger children were reluctant because they thought the Science Gallery was designed for older children (i.e., age 9 and above).

### Use

Once the family entered, they used the space in a way that was consistent with their parenting style and with the general patterns of their shared experiences. Parents who are controlling and instruction-oriented at home were controlling and instruction-



oriented in the Science Gallery. Children who were by nature private and self-reflective used the Science Gallery in an intimate, personal way.

Most of these families were especially drawn to the microscopes, the GeoSphere computers, the rotating globe, and the solar system model. For some individuals a less popular item, such as the terrarium, the box of bones, the butterflies, fossil replicas, and even an empty desk drawer, was just as important, or even more important.

The choice of activity seemed to be based on a combination of accident, prior experience, personal interest, learning philosophy, and potential for a particular type of social interaction. Microscopes, for example, appealed especially to children who had used microscopes elsewhere, to children interested in beetles, to children who could use them comfortably or successfully, to children who wanted to deal with real things rather than abstract images, and to children whose parents encouraged private exploration (since the image could not be shared readily).

### **Meaning**

These visitors seem to place their Science Gallery interactions within the broader context of their developmental experiences. Children were most deeply involved in Science Gallery activities when those activities reflected long-standing personal concerns. For some families the Science Gallery experience seemed to be viewed as one of a class of activities identified as "hands-on" or associated with particular types of museums, such as natural history museums, science centers, science museums, and "the Smithsonian."

## **Introduction**

### **The Questions for this Study**

The purpose of this study was to gain insight into the ways that family groups used the Science Gallery. It focused on groups that were fully engaged in the experience of the Gallery and thus seemed to be gaining something from the encounter. This study did not intend to investigate the average experience of visitors, or to differentiate which visitors find it most satisfying, but rather aimed to understand how and why the experience is successful for those visitors whom it seems to satisfy. Because of its qualitative method, in addition, this study does not describe all the possible ways that families are using or benefiting from the Gallery, nor can it suggest how many family groups in the visitor population are having the kinds of experiences that the study describes.

### **What the Research Literature Says about Families in Museums and Zoos**

Most of the research in this area has been conducted in science museums, natural history museums, zoos, and aquariums, locations where multigenerational visit groups are especially common. The studies seem to agree that the dominant focus of family museum visits is the family experience (Rosenfeld 1979, 1982; Gennaro and Heller 1983; Dierking 1989). In the words of one researcher, "Families do not come to museums to learn. They come, first and foremost, to have a good family outing. All else is secondary." (Hilke, 1987) Moreover, the needs and interests of the child drive the visit agenda (Laetsch 1982). Children describe their aim as "having a good time" and "doing interesting things" (Rosenfeld 1979). At the zoo this means "seeing new animals, having new experiences, touching animals, finding out about themselves, and comparing themselves to animals." (Rosenfeld 1982).

McManus found that the degree of social intimacy within a group (as determined by body language) also plays an important role in determining how an exhibit is encountered and how long the group talks about an exhibit (McManus 1988). Parents frequently use the museum visit as an occasion for socialization in museum visiting, telling children how to behave, how to use labels, and what to look at (Kropf 1989). Sometimes adults themselves do not understand what an exhibit is about and prevent children from participating as they (and the museum staff) would like (Stone 1982; Diamond, Smith and Bond 1988).

Overall, different family groups will attach different meaning to their experiences because of different values (Aveni 1991). The ideas the family visitors come away with will not necessarily match the intentions of the exhibit planners (Macdonald 1992).

### **What the Research Predicts about Behavior in the Science Gallery**

Amazonia is a rich and varied zoo experience. It has all of the exhibit characteristics that researchers have found to be significantly associated with learning: its displays are multi-

sided, multi-user, accessible, multi-outcome, multi-modal, readable and relevant (Borun and Dritsas 1997; Borun, Chambers and Cleghorn 1997; Borun, Chambers, Dritsas and Johnson 1997). Between the exhibition and the Science Gallery, the Amazonia building contains virtually every medium in use today: live exhibits, stationary exhibits, low-tech interactives, computer interactives, videos, objects to handle, books to read, games to play, and staff to interact with. In addition it has one feature that most other exhibition spaces do not have: four working science labs.

Because of this rich environment we can expect that family visitors will behave in much the same way that they do at traditional zoos, science centers, science museums, children's museums and discovery rooms, depending on the specific display they are engaged with.

The literature predicts that, in the Science Gallery, interactive displays will engender rich opportunities for discussion between adult and child, and encourage debate and argument (Blud 1990). Children will focus on the doing, with parents more inclined to supervise and watch (Rosenfeld 1979). Touching objects will be a favorite activity for younger children. (Diamond, Smith and Bond 1988) Many of these interactions, however, will be superficial (Diamond, Smith and Bond 1988).

Finally, the literature predicts that families will come "with their own visions and predispositions for particular imaginings." (Macdonald 1992) As a result they will probably find meanings in Amazonia that were not anticipated by the exhibition planners.

### **The Method for this Study**

This study is based on tape-recorded interviews with 12 family groups in the Amazonia Science Gallery. The interviews were conducted on three days during the busy summer season (May 27, June 11 and June 17, 1998). Families were selected for interviewing only after their behavior had been unobtrusively observed for some time and it seemed that they were seriously engaged in one or more elements of the Gallery. Interviews ranged in length from ten minutes to 30 minutes and were conducted with several family members together at the location in the Gallery where they were engaged.

After each interview fieldnotes were prepared which described the family, the setting in which the interview took place, what had been observed of the family's behavior before the interview began, and key points from the interview. The tape recording of each interview was entered into the computer as a separate sound file.<sup>15</sup> Key moments in the interview were marked with identifying labels for further reference. Analysis consisted of repeated listening to important sections of the interviews, extended notes on individual interviews, and descriptions of patterns and differences.

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<sup>15</sup> Using MicNotePad for Macintosh.

## Families in the Amazonia Science Gallery

### 1. Learning from the Intelligence of Animals

B. is a 9-year-old boy. He was first observed sitting alone, deeply immersed in one of the GeoSphere computer stations. He seemed to be particularly interested in African mammals. It was 3:30 on a Wednesday afternoon and the Gallery was very quiet, virtually empty, in contrast to the high levels of activity earlier in the day. B. sat quietly at the computer for at least 15 minutes, moving steadily through the choices with a high level of concentration. The interviewer wondered whom he was here with. There wasn't any adult that seemed to be related to him. Finally the interviewer noticed B. walking through the Gallery with his mother, and they sat down together to talk. B. was the primary respondent. He was surprisingly eloquent.

When they lived in Washington, they came to the zoo every day, and on each visit they came to Amazonia. The Science Gallery is B.'s favorite part, and his favorite part of the Science Gallery is the Flight of the Bumblebee music on one of the computers (not the one he was sitting at when he was first observed). Now they live in Montgomery County, in the Maryland suburbs, and they are only able to come once or twice a month. He expects to be coming more frequently in the future, since they are about to start home schooling. They are going to a meeting soon for Montgomery County home-schoolers where they will be discussing group activities such as trips to the zoo.

#### B'S VIEW:

In the rainforest he is attracted to creatures discovered first in the rain forest, and also to the snapping turtle, because he has a box turtle at home. He really likes the piranhas. He missed them when going through the rainforest today and thought they were gone. He'd like to see sharks too. He liked the beetle collage, and asked, "why are there so many different kinds of beetles?" The bat house used to be his favorite until they took away the vampire bats. He knows about vampire bats from reading.

Here in the Science Gallery he wished that the GeoSphere computers could show what animals, that don't normally meet in the wild, would do if they were suddenly put together, "like in a zoo." Would carnivores, e.g., lions and tigers, fight one another? Would different types of bears get along?

B. offered that there is a big difference between carnivores (which he sees as aggressive and dominant) and herbivores (which he sees as peace-loving potential prey). He proposed that territoriality and attitudes towards the young often drive aggression. "Lions are really protective when there are babies in the area." "Cheetahs will never forgive you if you touch one of their babies" (he said that you have to go through an elaborate scent-masking to touch a cheetah baby). Male hyenas, on the other hand, will eat baby hyenas. (He learned this from TV, where he likes to watch animal specials when he runs across them). "That's why it's important to know the meaning of hyena laughter. A low-pitch call probably means they have spotted some prey and it's time to attack."

The forest is dangerous. At this very moment, he said, a sloth in the Amazon is probably slowly making its way down a tree to the water. But if the water is moving too swiftly it might be swept away. For carnivores, life is just a matter of "eat or be eaten." For herbivores, it is more like, "take a bite and duck." You need to always be on the lookout for carnivores, he said.

In B.'s opinion, you can learn about everyday life from the zoo. You can learn from the herbivores that the world is a dangerous place. In real life, too, in a dangerous area you need always to be looking around you to make sure there is no one with a gun. You have to keep your head down and stay out of sight.

Herbivores, he thinks, are naturally friendly animals. Like the kangaroo, for example. "But if you mixed it with other animals, like in a zoo, say with a goat or a ram, it might have to fight to defend someone or something."

When he grows up, B. wants to be President. "I'm going to be like animals. I'm going to take some intelligence from the animals. I'm going to say 'Men, never attack anybody. If they attack you, you may defend. Never with your high-tech guns, unless they attack you first.'"

#### HIS MOTHER'S VIEW:

She thought it would be wonderful if B. could meet and talk with a real scientist and "get the big picture," by finding out how they do observation and what equipment they use. They once took a special behind-the-scenes FONZ tour with a volunteer, but that person wasn't a scientist.

His mother likes the Science Gallery because it is so quiet. She likes to spend her time just staring at the terrarium, having what she calls "Tibetan time." Other women she's spoken with here in the past also said, "It's so quiet down here. You can think. It's not just a bunch of bodies pushing and shoving."

#### DISCUSSION

B. seems to use the zoo as a symbolic universe, a metaphor or way of thinking about his own life. He clearly identifies with the innocent, non-aggressive animals, the herbivores in his mythology. But the world is dangerous, and when animals of different species (perhaps similar to people of different kinds?) are put together in an artificial environment like the zoo (perhaps similar to the city?) there may be conflicts. Aggression and defense are often influenced by the presence of young. He may feel this in his own life.

His mother is not unlike him. Although they did not spend any of their time in the Science Gallery together, she too was consciously seeking a contemplative experience away from the stresses of the crowded zoo. In meditating on the terrarium, she too was entering a symbolic universe.

These two probably come so frequently because the zoo in general (and the Science Gallery in particular) is meeting their needs for self-understanding. As the boy says, they are "taking some intelligence from the animals." In a dangerous world, how can you protect the young and defenseless, whose temperaments are naturally non-aggressive? Where do you find a refuge?

This interview emphasizes several important points. First, the Amazonia Science Gallery is a place that is different from the rest of the zoo, set apart and quieter. "Quiet" signs in the bridging area and on the stairs into the Gallery, the change in atmosphere between the rainforest and the Gallery, and the architectural suggestion that the Gallery is a "working" or "official" space -- all serve to signal that this space is different.

Other visitors echoed the idea that the Science Gallery is special because it is quieter than the rest of the zoo. One woman was making her second visit to the Science Gallery because she thought it wouldn't be crowded. Another visitor pointed out that the family always chooses to visit the Science Gallery after 1PM, when they know the school groups will be gone.

Second, this interview highlights the role that the zoo plays as a metaphorical universe, one with its own system of intelligence that can be used to inform everyday life and experience. This is one way that visitors find satisfaction in a zoo visit, and it has a direct counterpart in other museum experiences, such as the imaginative identification with mammals that some visitors feel in a natural history museum.

The metaphorical response is strongest in children. One mother interviewed in this study discussed how her boys (ages 2 and 4) like to imagine themselves as animals when they play -- T. Rex, chipmunks, chickens, woodpeckers, cockroaches. "In the chipmunk game," she explains, "the younger boy is the baby chipmunk and I'm the mommy chipmunk." She sometimes tries to focus this play on the real animals by going to the library to look it up. Other children interviewed in the Science Gallery, when talking about their favorite animals, told how they resemble that animal. For example, a boy who said he loves cheetahs because they run fast then added, "I'm a fast runner, too."

The GeoSphere computer, because it allows you to choose from many different kinds of animals, to focus on their distinctive characteristics, and to consider how they relate to one another, seemed to work well with this process of metaphorical imagining.

## **2. A Place for Exploring Seeing**

This interview was conducted on a Thursday around noon at a GeoSphere computer with a father as his 7-yr-old son used the computer. Throughout the interview the father patiently responded to all the child's requests, behaving as a resource but never as an instigator of activity. On the few occasions when the father tried to intervene, the boy brushed him off. The boy was hunting the GeoSphere program for things to look at (and he wants to grow up to be a deer hunter, he said). So there was relatively little exchange between father and son. The father seemed to have no particular interest of his own and was totally focused on the needs of his son and his other children, who appeared later.

While the father was being interviewed, his wife, who was with their 9-year-old daughter and 6 year-old son, was also being interviewed. The daughter and younger son moved back and forth between the two interviews (and their own activities in the space). The family gave the impression of being very much at home in the Science Gallery (e.g., swinging on chairs, moving back and forth between machines, etc.). At this point they had been in the building about an hour (according to the father).

The family lives a few hours away, near Shenandoah National Park, and tries to visit the zoo at least once a year, but they haven't been here in the last four years. They were in the Amazonia building once, before the Science Gallery was built. They are intending to spend all day at the zoo. They hadn't seen much of the zoo yet, since they had entered the parking lot near Amazonia and that's why they were here.

#### FATHER'S VIEW:

The father was not a particularly good reporter of what had happened in the Amazonia exhibition. He said that the big fish excited the older boy. The younger boy, he said, likes everything new -- also birds, sharks, and huge fish. The girl had remarked about the banana leaves. The kids wondered whether the fish would eat them if they fell in the water. They thought it was neat that it was so wet. They saw turtles and a parrot, too.

As they approached the Science Gallery the father wasn't sure it was a public space. It looks "like a library," he said. The kids led the way, and the parents figured that if they didn't belong there someone would tell them. Then they realized that the Gallery "is for experimenting." They saw some people in the seminar room, which is even less like the rest of the zoo than the Science Gallery. Being quiet, they figured, would be o.k., but if they were supposed to be REALLY quiet, that would be a problem.

Before the GeoSphere computers, they had all played with the microscopes.

They had been to the science museum in Richmond -- the kids like anything that is hands-on. By comparison, the father thought that the Science Gallery is bigger and "looks like a laboratory, like a place where you would come and do research," but he didn't realize that it was an actual lab and was surprised to hear it. He wondered if researchers were bothered by having the public around. He said he would be personally hesitant to approach a researcher, even if their door was ajar.

The father was very open about their home life. They live in a country-like setting, with goats nearby, and with dogs and hamsters as pets. The children like animals. The girl is most interested. She recently found and cared for several injured birds. And just before school ended they discovered that snapping turtles move back and forth across their lane between the neighbors' two ponds. Since their father was taking them to school, he brought it along to show the students. And once, about four years ago, they saw a black bear and three cubs as they entered a park trail near their home. The girl spotted them. The boys screamed.

Mother is a teacher. She did home schooling before and may start again next year. She wants them to make the most out of the summer, so she reads science books with the

whole family. The one they were reading at the time is about the earth and physics. They have one computer at home, but nothing as nice as the GeoSphere computer.

He said that the family would probably discuss the zoo visit on the way home. The parents would ask the kids what they liked most and what was most interesting for them. But there would be no attempt to formally make it a "learning" experience.

#### MOTHER'S VIEW:

In contrast with the father, the mother graphically described their experience in the habitat, but had nothing to say about their home life. She explained how the daughter was struck by the smell and how they all remarked on the heat and humidity. Then they all got down on the floor in order to look into the glass-walled pool from below the surface. They were looking for the little fish, imagining life under the water, and comparing the view from below with the view from above.

Along with her children, she was quite excited by the fish, and she talked about them with real enthusiasm. Although she wanted to read some information for herself, she couldn't because the children weren't willing to stop. It was an emotional event for her. Her own size was the measure of the fish's size.

The mother also talked about her daughter's fascination with birds, and how her daughter's maturing interest in things makes her more interested in slowing down and looking, while the boys just want to charge ahead to the next thing.

One of her purposes in coming to the zoo was that she wants the children to feel comfortable in places like this and to know that it is possible to learn and have fun at the same time.

Her remarks have a central theme -- seeing -- which she expressed in statements such as, "they are getting different perspectives," "they are getting more pictures of the world," "they are seeing that the world is big and different," "mostly they're interested in observing and seeing things they've never seen before," "I just let them look," "they were too busy just making observations," "I just want them to see it, observe it, and be fascinated by it," "it's normal that what they see is different from what I would see," "I am most interested in letting them explore, see, and experience."

#### DISCUSSION

The search for multiple perspectives seems to be very important to the mother and seems to reflect a value system and underlying philosophy of learning. Perhaps because of that philosophy, neither she nor her husband was attempting to directly instruct the children or guide their experience. They served primarily as willing assistants waiting to be called upon for help, if needed. The Science Gallery seemed to work so well for them because it offered a wide variety of exploration possibilities and allowed for many different kinds of "seeing" on scales ranging from the microscopic to the planetary.



In this sense their experience of the Science Gallery paralleled their experiences with animals at home. It was one more site for exploring, where you never know what you'll notice next. They used it as an extension of their interests and their way of being together at home. Their experience reminds us that in many ways the museum or zoo experience is continuous with other family activities.

The father's description of his hesitation about entering the Gallery points out the two-part decision involved in entering: the right to enter, and the desire to enter. He wasn't sure about permission, but his sons' desire overrode his uncertainty. In the pattern they had established elsewhere, the children led and he followed.

### **3. Wanting to Work with Animals**

The main respondent in this interview was a 12-year-old girl who wants to be a dolphin trainer. She was visiting with her mother and her 11-year-old brother (who wants to be an astronaut). They were first observed using the microscopes for an unusually long time. Then they went to the shop and returned to the microscopes again, and were interviewed. None of them were observed approaching a computer. When using the microscopes they each worked individually and only came together as a group when the interview began.

This was their first time to Amazonia and their first time to the zoo in a year. Usually they go 3-4 times a year. The favorite part of Amazonia for the children was the fish, for the mother the Science Gallery. The fish caught the girl by surprise so that just for a moment, she was scared by it. It thrilled her.

The girl saw dolphins at the National Aquarium in Baltimore and has also seen a TV program on them. She also loved the National Aquarium in Baltimore because she could hold living starfish and crabs there.

This family loves animals and has unusual pets. Either now or at one time in the past they had iguanas (named Godzilla and Godzuki), a python, a snake named Happy (who loved to be held) and a snake named Attitude (who hated to be held), an eel, a sea anemone, a chocolate-chip starfish, dogs, cats, and white mice. In addition the children have "hundreds" of stuffed animals. Each animal, real or toy, has its own name. One of the ways they play with their stuffed animals is to put three of them together as a band. The boy made small instruments for them to play. (Their dad is in a band.)

Both the girl and her mother thought that the Science Gallery labs were working labs. Mother was watching a scientist in the Nutrition Lab, but didn't think about talking to her since she seemed to be busy. When they were asked if they would like to meet a scientist they said yes, and the interviewer introduced them to a young researcher in the Behavior and Bioacoustics Lab. He gave a very interesting and clear 5-minute presentation on the research, and answered their questions about equipment in the lab. The mother asked what was in the terrariums outside and he explained that very well too. When he heard about the girl's interest in dolphins he also described how dolphins use sound. At the end of the visit he let them hold a bear skull (which especially pleased them).

After we left the lab the girl mentioned that they are going to start home schooling in the fall. She had been home-schooled for kindergarten and first-grade, but then had gone to private school. When the interviewer asked why she was going back to home schooling, the girl listed these advantages: "you can do it at your own pace," "you have a year to finish the work," and "you can take more breaks and be more comfortable." Her mother explained that their religion taught them that there are three barriers to learning: "lack of mass" (which she described as seeing images rather than the real thing), "too steep a gradient," and "a misunderstood word" (which, she said, causes either confusion or frustration). They are planning to use the Science Gallery as a home schooling resource whenever the checklist calls for animals, science, or microscopes.

## DISCUSSION

This family group was delightful to interview. All of them were open, relaxed, and had a great sense of humor. Perhaps their sense of ease is linked somehow to the attitude towards learning that their mother self-consciously fosters. Certainly they have an especially strong attraction to the "real thing," as shown by their love of odd pets and their strong interest in the microscopes. The girl's experience with the National Aquarium in Baltimore also stood out for her because she could really touch the animals. Here at Amazonia, she said, "the best part is that there is a real rainforest." Unlike nearly all the other visitors interviewed in this study, they did not show the slightest interest in any of the computer displays.

One other girl who wants to work with animals was interviewed in this study. She is 16 years old and her mother said that she has been fascinated with lions ever since the third grade. Lions were always a "big thing" for her, the girl said, and she wants to live with lions. She felt that this interest came from loving her cats and from watching them, and she recalled that she once petted a baby tiger at a private zoo, held it, and fed it milk from a bottle. Recently she was able to get a pen pal in Kenya and now she wants to visit Africa. Her mother felt that it would be very important for her to meet a scientist, but at the time of the interview there weren't any available staff or researchers for her to talk with.

The interviews with these two girls point out the effectiveness of having a mix of materials and approaches in the Science Gallery, both those based on "real things" and those based on images or concepts. It also highlights the importance of finding ways to assist visitors in making connections with the scientists.

#### 4. The Teaching of Learning

R. is a six-year-old boy who came to the zoo with his mother. They were first noticed sitting at the solar system model. The mother was explaining and reading from a text. Then they moved to the large globe. R. looked bored, but his mother kept trying to catch his interest. During the first part of the interview he was extremely active. The interviewer had to chase after him, since he seemed unable to stand still for more than a few seconds.

##### R.'S VIEW:

R. is very interested in animals and has been to Amazonia many times, but this was his first time to the Science Gallery. He said he would like to be a paleontologist (a word he came up with after his mother gave him just a little help). His favorite dinosaurs are the ones that are big and look like monsters. His favorite animals in the zoo are the giant python and the crocodiles. When the interviewer asked him what he thinks the crocodiles are thinking, he replied that they "are thinking if they eat it all, they can have the world to themselves." This reminded him of the great white shark "which feels it has to eat anything it feels like, even litter. They're hungry, they're fierce and they like to eat lots of things."

They had been to NMNH many times, "but never saw Egypt." They were eager to go back to look at Egypt. "Egyptians are cool," he said, "because they use lots of animals." He also volunteered that he is interested in the Incas. "And do you want to know something about Amazonia?" he said, "The Incas have a jaguar as their god." He learned this, he said, from a library book. When the interviewer asked him what animal he would make as a god, he proposed something half crocodile and half T. Rex.

He offered to show the interviewer the solar model and he moved it around the way his mother had. When the interviewer asked him to explain night and day, he ran over to the big globe to show how day and night work. Pointing to the Isthmus of Panama he said, "that's the Bering Bridge. They were chasing woolly mammoths." When the interviewer asked if he ever saw one, he said, "they're not alive today. They got extincted by people."

When the interviewer asked about other animals that might get "extincted," he said, "Mommy said it was very bad to captivity the manatee. Little girls want to captivity one."

Asked if he knows any scientists, he said "only the one I saw on TV, Bill Nye. Is he a real scientist?" His mother reminded him that they know a squid researcher. R. added, "an invertebrate can kill cancer."

When the interviewer asked him about the microscopes he decided to try them right then. First we stopped at the tarantula. R. wanted to see a black widow. He wasn't impressed. "They're little ones," he said dismissively.

R. became very involved in the microscopes, staying quietly in one place for the first time since he was observed. He had a little trouble seeing at first and had to kneel on the chair.

## HIS MOTHER'S VIEW:

According to his mother, R. is very interested in ancient civilizations and animals. They visit NMNH a lot and read books together. Suddenly he became interested in Egyptians and she told him about the mummies at NMNH, so they're planning to go there next. She likes to help him follow up on whatever subject interests him. She feels fortunate to live in the area so that they can do these things.

When R. first entered the Science Gallery, according to his mother, he felt that the Science Gallery wasn't for kids his age and that there was nothing there for him. She agreed that "except for the globe, it seems to be for older kids." But she didn't want to give up and, she added, "we'd never before been here." So she persisted.

R. is her only child. She works part-time as a superintendent of a church school system and is glad that she has the time to spend with him. When she was a child she had three older brothers and her parents did not take them around very much. Her father took her on occasion to the St. Paul Science Museum but "they didn't have as much time, or money" for her as she does for her son.

At NMNH R. really loved the insect zoo, especially the termite mound, which he likes to climb into. "I could stay there for a hundred hours," he interrupted, looking up from his microscope. During the interview, his mother repeatedly helped him with the microscope and added little pieces of information, such as "there are five times as many beetles as mammals." She admitted that she really enjoys learning and finds it exciting. "It's a bonus when he does too," she said.

## DISCUSSION

The mother is very committed to teaching her son both information and how to use the Science Gallery; they regularly take advantage of a wide range of informal learning opportunities; and the boy is deeply interested in animals and insects.

Nonetheless, it took the accident of the interview for him to discover the one part of the Gallery that seriously held his interest, the microscopes. Perhaps because he is so restless or perhaps because the setting is not really suited to a child his age, the idea of sitting down at the microscope did not occur to either him or his mother.

His use of the microscope highlighted some difficulties with this station. The seats and tables are set at heights suitable for adults, but not children. He had to kneel on the chair, and others who were interviewed in this study, such as a 4-year-old girl, had to stand on the chairs to see. Even then, the stereoscopes are hard to use. Two visitors suggested that the microscopes should be linked to external screens so that you could see the magnified image without having to look into the lens.

Of all the families in this study, this mother was the most committed to helping her child learn specific information in specific ways. If she had not had the solar model to work with, she would not have been able to hold him in the Gallery at all. She used it as a way to try to calm him down and get him to focus, but the model was too abstract for him and too far from his interests. This type of child seems to need something like the insect zoo's termite mound, a physically interactive environment exclusively directed to the younger child, something he would have recognized as being for kids like him as soon as he entered the room.

## 5. A World of Opportunities

S. is a 13-year-old girl who was visiting the zoo with her mother. As the interviewer was writing up notes from a previous interview, S. approached him and asked about the fossil replicas on the table where he was sitting. "What's that?" she said. "A trilobite," he replied. "Is it real?" "No, I think it's a replica." S. immediately moved on and the interviewer started to talk to her mother, who was following her.

S. suffered brain damage as the result of a childhood bout with leukemia. Although her doctors had predicted that she would have to be institutionalized, S. has managed to avoid that fate. She goes to a special school (where there is no science), and with the help of medication she has been able to lead a somewhat normal life. S. can hear in only one ear, her speech is a little hard to follow and she has a very short attention span, but she is obviously very bright, open, and inquisitive. She reads a lot at home, uses the Internet, and is very interested in science, animals, and the Learning Channel.

After the exchange about the trilobite, S. sat down in front of the box of bird bones and started handling them with the forceps. As S. looked carefully at the bones (explaining to her mother that the sign says not to touch them with your hands), her mother explained that S. was very interested in anatomy, perhaps because her mother is a paramedic. Once S. tore out photo illustrations from her mother's autopsy book and took them to school. When her parrot died she wanted to do an autopsy on it, and eventually she did autopsy a baby animal that had died. On her own she identified nearly every part of the animal, using her mother's books. As S. worked with the bird bones, she and her mother discussed some identifications of specific bones.

Her mother explained that S. has always been fascinated with babies, both human and animal, and with development. S. interrupted to ask, "Was I fascinated with myself when I was born?"

Her mother said that during her own childhood she was also very interested in science and very inquisitive. There was not much support at home and her most positive experiences with science did not come in school, either, but through other organizations. At the age of 15, for example, she volunteered at an eye hospital and dissected eyes. Her teachers in school introduced her to outside programs at a local academy of science that she felt made a big difference to her.

After spending about 12 minutes with the bones (an unusually long time for her), S. moved to the desk opposite the bones and started looking through the drawers. Her mother started to stop her, but the interviewer encouraged her to go on, pointing out that

the staff expected visitors to use the drawers. In the back of one drawer, S. found a piece of wood and asked what it was. The interviewer suggested that it might be a broken divider. S. continued hunting in the drawers until she found the missing clip, which she triumphantly held up before using it to fix the divider. As soon as she put the drawer back together she was off to another part of the Science Gallery and the interviewer lost sight of her as her mother continued the interview.

As the interview was ending the mother started looking for S. and found her in the nutrition lab, holding a 14-month-old baby. The baby's father had let S. take his baby, trusting her completely. S. held the baby for a few minutes, radiant with the joy of it, until her mother suggested that she give the baby back. After S. returned the baby, her mother gave her medication and they left the Science Gallery. Altogether S. was engaged in the Science Gallery for at least half an hour.

## DISCUSSION

The experience of this young girl in the Science Gallery demonstrates the value of a dense, varied environment. She was the only person that was observed using the box of bones during this study, but she found this simple offering fascinating, since it tied directly to her interest in animal autopsy. Even more striking, however, is the way she used the desk itself as an opportunity for discovery and experimentation. She spent quite a bit of time trying to figure out how that divider worked and she was thrilled when she succeeded.

This interview also stood out because of the strong similarity between the childhood interests of the mother and her daughter. Since the mother had not found her own science interest stimulated in school as much as outside of school, and since her daughter's special school does not even teach science, she has a strong interest in informal education. She said that the two of them regularly visit the science museum in Richmond. Thinking about her own history and how much she gained from the connections her teachers made for her with local centers of informal education, she recommended that the Science Gallery have some sort of linkage to schools.

One of the most important lessons of this interview, however, is the value of an environment that invites experimentation, seeking and exchange. Although her mother tended to be worried about rules, boundaries and appropriate behavior, S. felt completely free. The possibilities that she saw in this space were not just the objects and stations that are so obvious, but also the furnishings and the other people using the space. S. was experimenting with the interviewer when she first approached to ask about the trilobite and she was experimenting with the man who let her hold his baby. The Science Gallery is an environment that supports all of these kinds of experimentation.

There are other types of museum spaces that seem to encourage activity like this. Several other visitors discussed science museums, for example. One of them, a father who was a scientist and educator, emphasized how the Science Gallery differed from the typical science museum, which he described as a place where kids don't get a chance to think or do anything except run around "pressing buttons without paying attention to what happens."

Other children in this study were observed taking advantage of the social opportunities in the Science Gallery. At the microscopes, for example, as her mother was being interviewed, a four-year-old girl instantly made friends with the children around her, and they delightedly shared their discoveries. When the interviewer commented on how easily the girl made friends, her mother said that she wants her daughter to interact with other children in places like this, but that most parents are reluctant. The Science Gallery, because of its overall ambience, seems to reduce that sense of reluctance.

## **Observations and Suggestions**

### **Parenting Styles in the Science Gallery**

The interviews with Science Gallery families revealed a range of parenting behaviors. At one extreme was a family from Utah – the mother and father sat down together and quietly discussed the schedule for the rest of their Washington visit while their children explored the Science Gallery on their own. At the other extreme was the scientist father who made an effort to turn every moment in the Science Gallery into an instructional moment for his son. Most parents behaved somewhere between these two extremes.

The Science Gallery suited all of these styles, so that parents seemed to feel comfortable following the style that they preferred. Some of the suggestions that parents made may have reflected their desire for set-ups that favored their particular style. For example, one mother who liked to do things together with her little girl expressed unhappiness with the microscopes and suggested that the enlarged images should be visible on a screen where they could share the experience. Similarly, the scientist father who focused strongly on conceptual learning felt that the Science Gallery should include more explanations of things.

Because the chairs in the Science Gallery are movable, there were times when only one chair was available at a computer station and parents and children couldn't sit down together. Most parents seemed hesitant to re-arrange the furniture to accommodate their needs.

### **The Amazonia Science Gallery as a Type of Community**

In a number of ways the Science Gallery functions for these visitors as a type of free-flowing community. Children interact with other children; family groups display behaviors suggesting belonging and ownership (e.g., climbing onto things, taking photos, sliding down the globe base, holding back the revolving globe, sitting on the floor); parents attempt to decipher implicit social rules; children claim their own private space apart from their parents (e.g., looking in a microscope, running off to a lab, listening to a wand-speaker); and children contest their parent's authority (e.g., insisting on controlling the computer mouse, showing unwillingness to leave).

Family behavior within this enclosed community seemed markedly different from family behavior elsewhere in the zoo. In the crowded pathways outside, for example, families seemed to make much more of an effort to stay close together physically. The Science Gallery seems to be viewed more as a “safe haven,” where visitors let down some of their guard.

Visitors enter the Science Gallery when they have the sense that they are the kind of people who could feel good in this kind of setting. This study suggests some of the factors that influence this feeling. From the observations and the interviews, it seems that visitors consciously or unconsciously ask themselves a series of questions as they are deciding whether or not to enter: Am I the kind of person who feels comfortable in a place where you are expected to be relatively quiet? Am I interested in experimenting? Am I in a hurry? Do I feel comfortable in a place where the rules are implicit? Am I the right age? Do I have the right interests? Do I mind trying to figure out things by myself? Am I willing to ask people for help?

We could describe this decision-making process in several ways. We could call it a calculation of barriers and inducements – “what does this place have to offer, and what will I have to go through to get it.” We could also call it an estimation of belonging and identity – “is this place the right kind of community for a person like me.”

### **Home Schooling**

A number of these family groups said that they had done home schooling in the past, were doing it now, or planned to do it in the future. Although none of the family groups in this study had specifically come to visit the Science Gallery as part of their home-schooling program, they recognized its value as a home schooling resource and looked forward to incorporating it into their future activity as appropriate.

Some of these home-schoolers might have been drawn to the Science Gallery through resource materials provided to them by home-schooling organizations – although no one mentioned this. However they first discovered it, their disproportionate involvement in the Science Gallery is probably related to their attitudes towards self-directed learning and personal development.



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## APPENDICES

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**APPENDIX A**  
**Tracking Map**

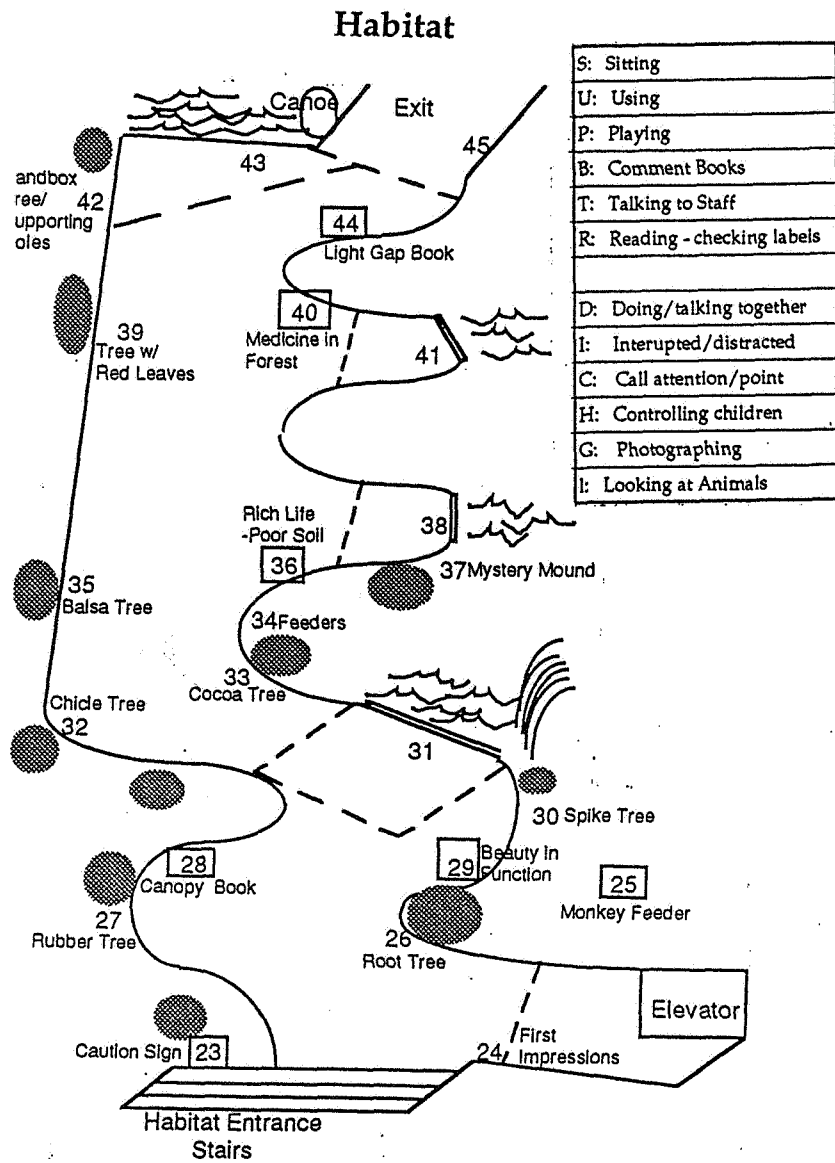
**Amazonia**

ID#: \_\_\_\_\_ Tracker: \_\_\_\_\_  
 Gender: \_\_\_\_\_ Session: \_\_\_\_\_  
 Age: \_\_\_\_\_ Segment: \_\_\_\_\_  
 Race/Ethnic: \_\_\_\_\_ Count#: \_\_\_\_\_  
 Group Size: \_\_\_\_\_  
 Group Composition: \_\_\_\_\_ General Stop = 00  
 Art Work = 99

in comments -  
 ✓ = parent/child interaction

Habitat Entrance				Time Begin: _____	
Stops	Loc.	Start	Stop	Inter.	Comr
1	Into River Sign				
2	Entrance Pond				
3	Species #'s Sign				
4	Living w. Floods Bk				
5	Pond Desk				
6	Giant Amg Rivers				
7	Big fish tank				
8	Piranha tank				
9	Kissing fish tank				
10	People snapshots				
11	McIntyre photo				
12	Dolphin model				
Field Station			Enter: _____		
13	aquarium				
14	poster				
15	microscope				
16	desk				
17	desk w/ objects				
18	Blow gun				
19	Lab				
			Exit: _____		
20	Bench				
21	Caution sign				
22	Landing/Dieffenb.				
			Exit: _____		

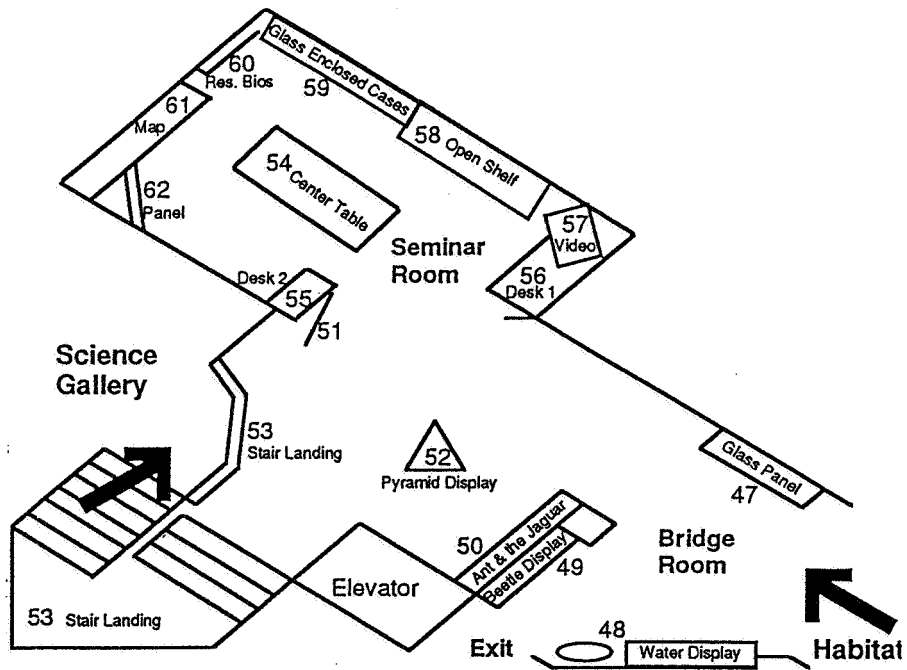
S: Sitting	D: Doing/talking together
U: Using	I: Interrupted/distracted
P: Playing	C: Call attention/point
B: Comment Books	H: Controlling children
T: Talking to Staff	G: Photographing
R: Reading - checking labels	l: Looking at Animals



otes:

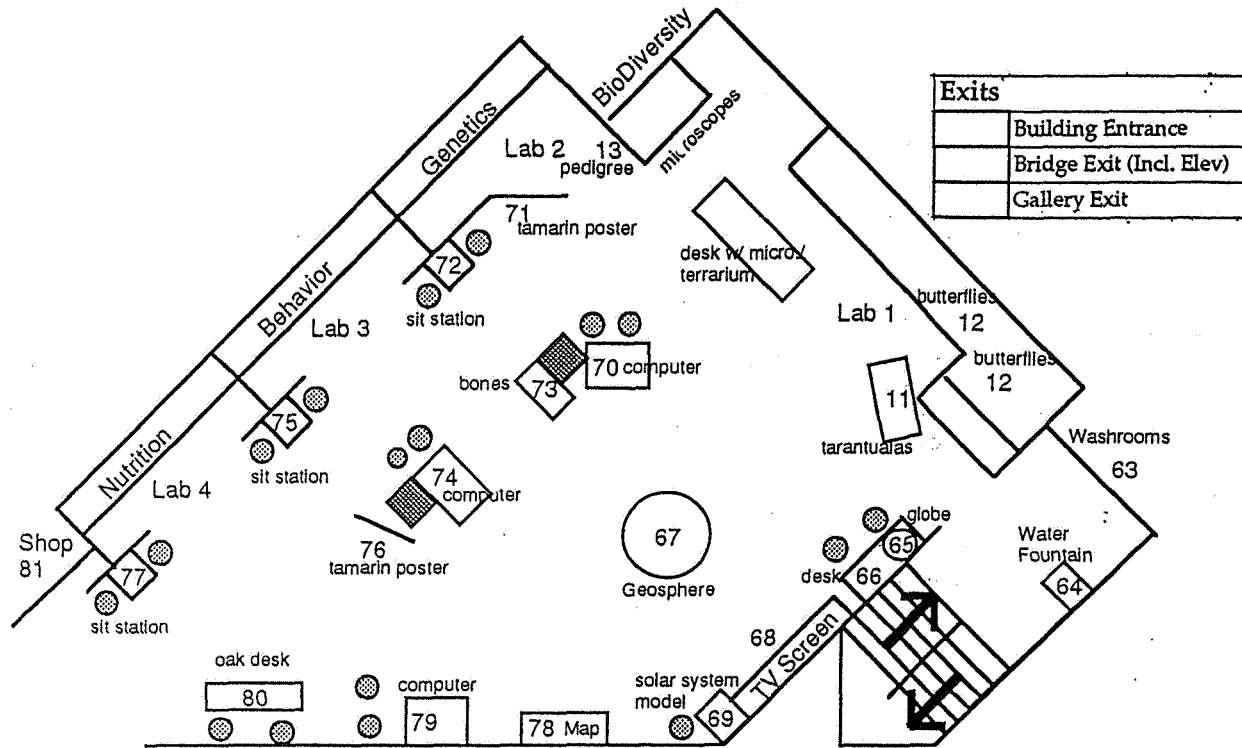
Enter Habitat: _____				
Loc.	Start	Stop	Inter.	Comments
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
Exit Habitat: _____				

in comments -  
 ✓ = parent/child interaction



Bridge Room		Enter: _____		Comments
Loc	Start	Stop	Inter.	
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
		Exit: _____		

S: Sitting	D: Doing/talking together
U: Using	I: Interrupted/distracted
P: Playing	C: Call attention/point
B: Comment Books	H: Controlling children
T: Talking to Staff	G: Photographing
R: Reading-checking labels	L: Looking at animals



D: Doing/talking together	S: Sitting
I: Interrupted/distracted	U: Using
C: Call attention/point	P: Playing
H: Controlling children	B: Comment Books
G: Photographing	T: Talking to Staff
L: Looking at Animals	R: Reading - checking labels

### Science Gallery

prefix	Start	Stop
1 Biodiversity	_____	_____
2 Genetics	_____	_____
3 Behavior	_____	_____
4 Nutrition	_____	_____

### In the Research Labs:

- 11 Tarantula Terrarium
- 12 Butterflies
- 13 Pedigree games
- 14 Counter area other
- 15 Microscopes
- 16 Staff Lab
- 17 Poster/sign/case/board
- 18 Terrarium
- 19 Hands-on (not microscopes)
- 20 Computer
- 21 Desk
- 22 Video

-61-

Enter: _____					
	Loc	Start	Stop	Inter.	Comments
01					
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

	Loc	Start	Stop	Inter.	Comments
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

Table A.1  
Behavior in Amazonia: Overall Visitors and Important Subgroups

A. Total Time in the Exhibition (Visit Times): Statistics						
Visitor category	No. of Visitors	Avg. Visit Time (Minutes)	Standard Deviation	Median	Max.	Q3-Q1
Total	139	16.8	9.3	14.8	48.0	10.5
Adults only	42	14.9	8.8	12.7	34.0	13.9
Adults with children	94	17.7	9.4	15.1	48.0	8.6
Science Gallery engaged	30	27.9	8.7	25.1	44.4	13.1
Science Gallery browsers	26	20.0	8.6	16.8	48.0	8.7
Science Gallery nonvisitors	48	14.9	3.7	14.4	28.5	4.6
Amazonia tasters	35	7.6	1.8	8.2	9.7	2.5
B. Total Time Observing (Total Time Stopped): Statistics						
Visitor category	No. of Visitors	Avg. Stopped Time (Minutes)	Standard Deviation	Median	Max.	Q3-Q1
Total	139	12.3	8.0	11.0	41.8	9.1
Adults only	42	11.0	7.9	9.8	30.5	11.5
Adults with children	94	13.0	8.0	11.2	41.7	7.9
Science Gallery engaged	30	21.7	7.5	19.5	36.8	12.8
Science Gallery browsers	26	14.1	8.2	12.2	41.8	7.41
Science Gallery nonvisitors	48	11.2	3.2	10.8	21.5	3.81
Amazonia tasters	35	4.4	1.6	4.6	7.0	1.89
C. Percent of Visit Time Spent at Stops: Statistics						
Visitor category	No. of Visitors	Avg. % Stopped Time (0.0 - 100.0)	Standard Deviation	Median	Max.	Q3-Q1
Total	139	69.9	15.1	73.0	93.0	14.0
Adults only	42	68.8	17.8	71.5	93.0	22.0
Adults with children	94	70.9	12.7	74.0	91.0	22.0
Science Gallery engaged	30	77.5	7.8	76.5	93.0	12.0
Science Gallery browsers	26	67.7	14.5	74.0	87.0	18.0
Science Gallery nonvisitors	48	75.8	11.3	78.0	91.0	12.0
Amazonia tasters	35	56.8	16.2	58.0	89.0	15.0

(continued)

Table A.1 (continued)  
Behavior in Amazonia: Overall Visitors and Significant Subgroups

D. Number of Stops: Statistics						
Visitor category	No. of Visitors	Avg. Number of Stops	Standard Deviation	Median	Max.	Q3-Q1
Total	139	13.1	7.7	11.0	46.0	9.0
Adults only	42	12.4	8.7	10.0	46.0	12.0
Adults with children	94	13.5	7.2	11.5	43.0	8.0
Science Gallery engaged	30	19.4	10.5	16.0	46.0	13.0
Science Gallery browsers	26	14.5	6.2	13.5	33.0	9.0
Science Gallery nonvisitors	48	12.8	5.1	12.0	24.0	7.0
Amazonia tasters	35	7.3	3.0	7.0	14.0	5.0

E. Stop Time (Average Time at a Unique Stop) : Statistics						
Visitor category	Unique Stops	Avg. Stop Time (Minutes)	Standard Deviation	Median	Max.	Q3-Q1
Total	1633	1.0	1.3	0.7	15.3	0.9
Adults only	477	1.0	1.2	0.6	15.2	0.9
Adults with children	1118	1.1	1.4	0.7	15.2	0.9
Science Gallery engaged	491	1.3	1.8	0.8	15.3	1.2
Science Gallery browsers	352	1.0	1.3	0.7	13.3	0.8
Science Gallery nonvisitors	545	1.0	1.0	0.7	11.4	0.9
Amazonia tasters	245	0.6	0.5	0.5	3.1	0.6

F. Total Time (Visit Times) In Science Gallery						
Visitor category	No. of Visitors	Average Time (Minutes)	Standard Deviation	Median	Max.	Q3-Q1
Total	139	3.8	6.0	0.0	27.8	6.1
Adults only	42	3.3	4.9	0.3	19.1	6.1
Adults with children	94	4.0	6.5	0.0	27.8	4.8
Science Gallery engaged	30	12.9	6.1	11.8	27.8	9.4
Science Gallery browsers	26	4.7	2.8	4.3	15.2	2.8
Science Gallery nonvisitors	48	0.0	0.0	0.0	0.0	0.0
Amazonia tasters	35	0.4	1.2	0.0	5.7	0.0



Table A.2  
Average Time Stopped/Gallery by Building Behavior Type (in Minutes)\*

Area	Engagement Segmentation			
	Amazonia Tasters	Science Gallery Non-visitors	Science Gallery Browsers	Science Gallery Engaged
Habitat entrance-Main	1.8	4.6	4.5	4.0
Field Station	1.3	2.3	2.3	2.6
Habitat entrance-other	0.3	0.6	0.4	0.3
Habitat	1.4	3.1	2.9	3.2
Bridge Room	0.5	0.9	1.2	1.3
Seminar Room	0.0	2.5	3.9	1.6
Science Gallery	1.6	0.0	2.7	10.6
Non-specific stop	0.5	1.0	1.3	1.0
Amazonia (Total)***	4.4	11.2	14.1	21.7
Number of Visitors	35	48	26	30
Percent of Visitors	25%	35%	19%	21%

\*Cell entries are the average time visitors stopped in a specific area for visitors who stopped.

\*\*Less than 5 visitors.

\*\*\*The sum of the individual entries in each column does not equal the total. The average time stopped/gallery is based only on those visitors who stopped in a specific gallery. The total is based on all visitors in each Engagement Segmentation type.

Table A.3  
Average Time Stopped/Gallery by Time Segmentation (in Minutes)\*

Area	Time Segmentation**				
	0-10 Min	10-15 Min	15-20 Min	20-30 Min	Over 30 Min
Habitat entrance-Main	1.8	4.0	4.1	4.8	5.6
Field Station	1.3	1.8	2.1	2.2	4.5
Habitat entrance-other	0.3	1.0	0.3	0.4	0.3
Habitat	1.4	2.2	3.6	2.8	4.4
Bridge Room	0.5	0.8	1.0	1.2	1.7
Seminar Room	0.0	0.4	2.0	1.8	3.0
Science Gallery	1.6	3.0	3.7	7.7	11.7
Non-specific stop	0.5	0.9	1.0	1.2	1.3
Amazonia (Total)	4.4	9.0	13.1	18.0	30.1
Percent of Visitors	25%	26%	23%	16%	10%

\*Total time from entry to exit in Amazonia.

\*\*Cell entries are the average time visitors stopped in a specific area.

Table A.4  
Percent of Visitors who Stopped in Each Exhibition Area

1	2	3	4	5	6
Exhibition Area	Number of Visitors	Percent of Visitors Who Stopped	Number Making Repea Stops in Area	Percent of Repeats in Area	Number of Possible Stops in Area
Amazonia (total)	139	100.0	67	48.2	119
Habitat entrance	139	98.6	14	10.2	12
Field Station	129	93.0	18	15.0	7
Habitat entrance-other	139	7.2	0	0.0	3
Habitat	135	93.3	24	19.0	23
Bridge Room	132	59.1	5	6.4	7
Seminar Room	20	95.0	0	0.0	9
Science Gallery	63	95.2	16	26.7	58
Non specific stop	139	49.6			

Table A.5  
Stops in the Amazonia Exhibition: Spatial Order

1	2	3	4	5	6	7	8
			Unique Stops: Statistics				
Map Loca- tion	Description	Percent Who Stopped at Each Exhibit	Average Time at stop (Minutes)	Standard Deviation	Median	Percent	
						of All Stops	of stops in Section
<b>Exhibition = 139 Visitors</b>							
<b>Generic Stops</b>							
0	General stop	41.0	0.93	0.87	0.67	3.5	n.a.
99	Art work	23.0	0.52	0.49	0.30	2.0	n.a.
<b>Habitat Entrance (Main)</b>							
		<b>98.6</b>					
1	Into the river sign-Habitat Entrance	0.7	0.20	. .	0.20	0.1	0.2
2	Entrance pond-Habitat Entrance	79.1	0.76	0.45	0.64	6.7	23.2
3	Species # sign-Habitat Entrance	6.5	0.38	0.19	0.32	0.6	1.9
4	Living with floods-Habitat Entrance	4.3	0.61	0.53	0.47	0.4	1.3
5	Pond desk-Habitat Entrance	0.0				0.0	0.0
6	Giant Amg Rivers-Habitat Entrance	4.3	0.54	0.43	0.47	0.4	1.3
7	Big fish tank-Habitat Entrance	94.2	1.89	1.66	1.37	8.0	27.6
8	Piranha tank-Habitat Entrance	61.9	0.73	0.61	0.52	5.3	18.1
9	Kissing fish tank-Habitat Entrance	71.9	1.03	0.80	0.83	6.1	21.1
10	People snapshot panels-Habitat Entran	2.9	0.96	1.09	0.59	0.2	0.8
11	McIntyre photo panel-Habitat Entranc	0.7	0.40		0.40	0.1	0.2
12	Dolphin model-Habitat Entrance	14.4	0.43	0.47	0.26	1.2	4.2
<b>Field Station</b>							
13	Aquarium-Field Station	84.2	1.54	0.87	1.43	7.2	59.1
14	Poster-Field Station	5.8	0.37	0.33	0.22	0.5	4.0
15	Microscope-Field Station	29.5	1.47	1.89	0.68	2.5	20.7
16	Desk-Field Station	5.0	0.89	0.95	0.77	0.4	3.5
17	Desk with objects-Field Station	5.8	0.36	0.22	0.28	0.5	4.0
18	Blow gun-Field Station	1.4	0.74	0.72	0.74	0.1	1.0
19	Lab-Field Station	10.8	0.54	0.84	0.25	0.9	7.6

(cont.)

Table A.5 (cont.)  
Stops in the Amazonia Exhibition: Spatial Order

1	2	3	4	5	6	7	8
			Unique Stops: Statistics				
Map Loca- tion	Description	Percent Who Stopped at Each	Average Time at stop (Minutes)	Standard Deviation	Median	Percent	
		1 Exhibit				of All Stops	of stops in Section
<b>Habitat Entrance (Other)</b>							
20	Bench	1.4	1.09	0.79	1.09	0.1	20.0
21	Caution sign for Habitat	3.6	0.32	0.19	0.23	0.3	50.0
22	Landing/Dieffenbachia	2.2	0.32	0.09	0.27	0.2	30.0
<b>Habitat</b>							
23	Caution sign for animals	1.4	0.85	0.61	0.85	0.1	0.4
24	First impressions book-Habitat	5.8	0.29	0.19	0.24	0.5	1.6
25	Monkey feeder-Habitat	1.4	0.35	0.17	0.35	0.1	0.4
26	Root tree-Habitat	31.7	0.77	0.67	0.59	2.7	8.8
27	Rubber Tree-Habitat	5.0	0.55	0.49	0.40	0.4	1.4
28	Canopy book-Habitat	5.8	0.35	0.23	0.28	0.5	1.6
29	Beauty in function book-Habitat	12.9	0.40	0.35	0.29	1.1	3.6
30	Spike Tree-Habitat	11.5	0.64	0.50	0.46	1.0	3.2
31	Fence 1-Habitat	71.2	0.86	0.62	0.72	6.1	19.9
32	Chicle Tree-Habitat	10.1	0.37	0.25	0.28	0.9	2.8
33	Cocoa Tree-Habitat	8.6	0.45	0.19	0.44	0.7	2.4
34	Feeders-Habitat	6.5	0.32	0.19	0.27	0.6	1.8
35	Balsa Tree-Habitat	5.0	0.55	0.53	0.37	0.4	1.4
36	Rich life/Poor soil book-Habitat	4.3	0.62	0.26	0.61	0.4	1.2
37	Mystery mound-Habitat	2.2	0.46	0.23	0.55	0.2	0.6
38	Fence 2-Habitat	46.0	0.86	0.76	0.65	3.9	12.9
39	Tree with red leaves-Habitat	2.2	1.30	1.52	0.52	0.2	0.6
40	Medicine in the forest book-Habitat	6.5	0.32	0.35	0.25	0.6	1.8
41	Fence 3-Habitat	51.1	0.73	0.45	0.72	4.3	14.3
42	Sandbox Tree/Supporting roles book-I	2.9	0.53	0.39	0.39	0.2	0.8
43	Fence 4-Habitat	46.0	0.65	0.50	0.50	3.9	12.9
44	Light gap book-Habitat	6.5	0.55	0.35	0.50	0.6	1.8
45	Fence 5-Habitat	13.7	0.59	0.80	0.40	1.2	3.8

(cont.)

Table A.5 (cont.)  
Stops in the Amazonia Exhibition: Spatial Order

1	2	3	4	5	6	7	8
			Unique Stops: Statistics				
Map Loca- tion	Description	Percent Who Stopped at Each 1 Exhibit	Average Time at stop (Minutes)	Standard Deviation	Median	Percent	
						of All Stops	of stops in Section
<b>Bridge Room</b>							
47	Glass panel-Bridge room	2.9	0.95	0.36	1.04	0.2	3.9
48	Water display-Bridge room	6.5	0.90	0.83	0.67	0.6	8.7
49	Beetle display-Bridge room	45.3	0.79	0.71	0.63	3.9	61.2
50	The and and the Jaquar-Bridge room	5.8	0.55	0.29	0.58	0.5	7.8
51	Easel sign-Bridge room	0.7	1.92		1.92	0.1	1.0
52	Pyramid display-Bridge room	2.9	0.69	0.51	0.51	0.2	3.9
53	Stair landing-Bridge room	10.1	0.44	0.28	0.41	0.9	13.6
<b>Seminar Room</b>							
54	Center table-Seminar room	5.8	3.95	4.46	1.86	0.49	24.2
55	Desk 1-Seminar room	0.7	0.23		0.23	0.1	3.0
56	Desk 2-Seminar room	3.6	0.72	0.32	0.85	0.3	15.2
57	Video-Seminar room	2.2	0.31	0.16	0.38	0.2	9.1
58	Open shelf-Seminar room	3.6	0.44	0.29	0.42	0.3	15.2
59	Glass enclosed cases-Seminar room	1.4	0.32	0.21	0.32	0.1	6.1
60	Researcher bios-Seminar room	2.9	0.42	0.12	0.42	0.2	12.1
61	Map-Seminar room	1.4	0.21	0.01	0.21	0.1	6.1
62	Free standing panel-Seminar room	2.2	0.70	0.56	0.63	0.2	9.1

(cont.)

Table A.5 (cont.)  
Stops in the Amazonia Exhibition: Spatial Order

1	2	3	4	5	6	7	8
			Unique Stops: Statistics				
Map Loca- tion	Description	Percent Who Stopped at Each 1 Exhibit	Average Time at stop (Minutes)	Standard Deviation	Median	Percent	
						of All Stops	of stops in Section
<b>Science Gallery</b>							
63	Bathrooms-Science Gallery	14.4	2.56	1.68	2.26	1.2	0.2
64	Water fountain-Science Gallery	3.6	0.31	0.16	0.23	0.3	0.0
65	Light Globe-Science Gallery	0.7	0.38	.	0.38	0.1	0.0
66	Table-Science Gallery	2.2	1.40	1.84	0.35	0.2	0.0
67	Geosphere-Science Gallery	20.1	0.86	0.92	0.58	1.7	0.2
68	Video screen-Science Gallery	0.7	0.17	.	0.17	0.1	0.0
69	Model of universe-Science Gallery	5.0	0.78	0.52	0.64	0.4	0.1
70	Computer 1-Science Gallery	9.4	2.70	2.32	2.15	0.8	0.1
74	Computer 2-Science Gallery	11.5	4.89	5.56	2.31	0.0	0.0
79	Computer 3-Science Gallery	6.5	0.89	0.58	0.68	0.2	0.0
71	Tamarin poster 1-Science Gallery	0.0	.	.	.	0.1	0.0
72	Sit station 1-Science Gallery	2.2	3.42	2.87	2.05	1.0	0.1
73	Bones station-Science Gallery	1.4	0.39	0.30	0.39	0.1	0.0
75	Sit station 2-Science Gallery	0.7	1.15	.	1.15	0.1	0.0
76	Tamarin poster 2-Science Gallery	1.4	0.72	0.52	0.72	0.0	0.0
77	Sit station 3-Science Gallery	0.0	.	.	.	0.0	0.0
78	Map station-Science Gallery	0.0	.	.	.	0.6	0.1
80	Oak leaf table-Science Gallery	3.6	3.39	1.33	3.80	0.3	0.0
81	Shop-Science Gallery	10.1	3.56	3.65	2.28	0.9	0.1
<b>Biodiversity Laboratory-Science Gallery</b>							
111	Tarantula terrarium-Biodiversity	12.2	0.58	0.37	0.52	1.0	25.8
112	Butterflies-Biodiversity	4.3	1.30	1.05	1.02	0.4	9.1
114	Counter area other-Biodiversity	5.0	0.35	0.14	0.42	0.4	10.6
115	Microscopes-Biodiversity	17.3	2.22	1.52	1.81	1.5	36.4
116	Staff lab-Biodiversity	2.2	0.34	0.25	0.38	0.2	4.5
117	Poster/sign/case/board-Biodiversity	2.9	0.61	0.46	0.48	0.2	6.1
118	Terrarium-Biodiversity	2.9	0.86	0.79	0.72	0.2	6.1
119	Hands-on (not micro)-Biodiversity	0.7	0.30	.	0.30	0.1	1.5
120	Computer-Biodiversity	0.0	.	.	.	0.0	0.0
121	Desk-Biodiversity	0.0	.	.	.	0.0	0.0
122	Video-Biodiversity	0.0	.	.	.	0.0	0.0

(cont.)

Table A.5 (cont.)  
Stops in the Amazonia Exhibition: Spatial Order

1	2	3	4	5	6	7	8
			Unique Stops: Statistics				
Map Loca- tion	Description	Percent Who Stopped at Each Exhibit	Average Time at stop (Minutes)	Standard Deviation	Median	Percent	
						of All Stops	of stops in Section
<b>Genetics Laboratory -Science Gallery</b>							
213	Pedigree game-Genetics	0.7	0.18	.	0.18	0.1	4.8
214	Counter area other-Genetics	0.7	0.52	.	0.52	0.1	4.8
215	Microscopes-Genetics	1.4	1.09	1.00	1.09	0.1	9.5
216	Staff lab-Genetics	2.2	0.72	0.28	0.72	0.2	14.3
217	Poster/sign/case/board-Genetics	2.2	0.38	0.09	0.42	0.2	14.3
218	Terrarium-Genetics	0.7	0.57	.	0.57	0.1	4.8
219	Hands-on (not micro)-Genetics	2.9	0.54	0.33	0.58	0.2	19.0
220	Computer-Genetics	3.6	1.56	1.06	1.68	0.3	23.8
221	Desk-Genetics	0.7	0.28	.	0.28	0.1	4.8
222	Video-Genetics	0.0	.	.	.	0.0	0.0
<b>Behavior Laboratory-Science Gallery</b>							
314	Counter area other-Behavior	0.0	.	.	.	0.0	0.0
315	Microscopes-Behavior	0.0	.	.	.	0.0	0.0
316	Staff lab-Behavior	2.2	0.63	0.12	0.65	0.2	33.3
317	Poster/sign/case/board-Behavior	0.0	.	.	.	0.0	0.0
318	Terrarium-Behavior	0.0	.	.	.	0.0	0.0
319	Hands-on (not micro)-Behavior	0.7	0.37	.	0.37	0.1	11.1
320	Computer-Behavior	1.4	1.38	1.34	1.38	0.1	22.2
321	Desk-Behavior	1.4	0.23	0.08	0.23	0.1	22.2
322	Video-Behavior	0.7	0.22	.	0.22	0.06	11.11
<b>Nutrition Laboratory-Science Gallery</b>							
414	Counter area other-Nutrition	0.0	.	.	.	0.0	0.0
415	Microscopes-Nutrition	0.0	.	.	.	0.0	0.0
416	Staff lab-Nutrition	0.7	0.88	.	0.88	0.1	50.0
417	Poster/sign/case/board-Nutrition	0.7	0.18	.	0.18	0.1	50.0
418	Terrarium-Nutrition	0.0	.	.	.	0.0	0.0
419	Hands-on (not micro)-Nutrition	0.0	.	.	.	0.0	0.0
420	Computer-Nutrition	0.0	.	.	.	0.0	0.0
421	Desk-Nutrition	0.0	.	.	.	0.0	0.0
422	Video-Nutrition	0.0	.	.	.	0.0	0.0



Table A.6  
Stops in the Amazonia Exhibition: Rank Order, by Percent of Visitors Who Stopped  
 (% of Visitors)

		1	3	4	5	6	7	8
		Unique Stops: Statistics						
Location Description		Percent Who Stopped at Each Exhibit	Average time					
			at stop (Minutes)	Standard Deviation	Median	Longest Stop		
7	Big fish tank-Habitat Entrance	94.2	1.89	1.66	1.37	11.38		
13	Aquarium-Field Station	84.2	1.54	0.87	1.43	4.10		
2	Entrance pond-Habitat Entrance	79.1	0.76	0.45	0.64	2.38		
9	Kissing fish tank-Habitat Entrance	71.9	1.03	0.80	0.83	6.13		
31	Fence 1-Habitat	71.2	0.86	0.62	0.72	3.92		
8	Piranha tank-Habitat Entrance	61.9	0.73	0.61	0.52	2.97		
41	Fence 3-Habitat	51.1	0.73	0.45	0.72	2.83		
38	Fence 2-Habitat	46.0	0.86	0.76	0.65	4.52		
43	Fence 4-Habitat	46.0	0.65	0.50	0.50	2.43		
49	Beetle display-Bridge room	45.3	0.79	0.71	0.63	4.80		
0	General stop	41.0	0.93	0.87	0.67	4.87		
26	Root tree-Habitat	31.7	0.77	0.67	0.59	3.84		
15	Microscope-Field Station	29.5	1.47	1.89	0.68	8.78		
99	Art work	23.0	0.52	0.49	0.30	2.46		
67	Geosphere-Science Gallery	20.1	0.86	0.92	0.58	4.00		
115	Microscopes-Biodiversity	17.3	2.22	1.52	1.81	6.00		
12	Dolphin model-Habitat Entrance	14.4	0.43	0.47	0.26	2.08		
63	Bathrooms-Science Gallery	14.4	2.56	1.68	2.26	6.53		
45	Fence 5-Habitat	13.7	0.59	0.80	0.40	3.72		
29	Beauty in function book-Habitat	12.9	0.40	0.35	0.29	1.57		
111	Tarantula terrarium-Biodiversity	12.2	0.58	0.37	0.52	1.48		
30	Spike Tree-Habitat	11.5	0.64	0.50	0.46	1.95		
74	Computer 2-Science Gallery	11.5	4.89	5.56	2.31	15.25		
19	Lab-Field Station	10.8	0.54	0.84	0.25	3.47		
32	Chicle Tree-Habitat	10.1	0.37	0.25	0.28	0.97		
53	Stair landing-Bridge room	10.1	0.44	0.28	0.41	1.06		
81	Shop-Science Gallery	10.1	3.56	3.65	2.28	12.51		
70	Computer 1-Science Gallery	9.4	2.70	2.32	2.15	7.18		
33	Cocoa Tree-Habitat	8.6	0.45	0.19	0.44	0.77		
3	Species # sign-Habitat Entrance	6.5	0.38	0.19	0.32	0.70		
34	Feeders-Habitat	6.5	0.32	0.19	0.27	0.62		
40	Medicine in the forest book-Habitat	6.5	0.32	0.35	0.25	1.22		

(cont.)

Table A.6 (cont.)  
Stops in the Amazonia Exhibition: Rank Order, by Percent of Visitors Who Stopped  
 (% of Visitors)

1	2	3	4	5	6	7
			Unique Stops: Statistics			
Location Description	Percent Who Stopped at Each Exhibit	Average time at stop (Minutes)	Standard Deviation	Median	Longest Stop	
44	Light gap book-Habitat	6.5	0.55	0.35	0.50	1.17
48	Water display-Bridge room	6.5	0.90	0.83	0.67	3.05
79	Computer 3-Science Gallery	6.5	0.89	0.58	0.68	2.05
14	Poster-Field Station	5.8	0.37	0.33	0.22	1.15
17	Desk with objects-Field Station	5.8	0.36	0.22	0.28	0.72
24	First impressions book-Habitat	5.8	0.29	0.19	0.24	0.72
28	Canopy book-Habitat	5.8	0.35	0.23	0.28	0.65
50	The and and the Jaquar-Bridge room	5.8	0.55	0.29	0.58	0.93
54	Center table-Seminar room	5.8	3.95	4.46	1.86	13.32
16	Desk-Field Station	5.0	0.89	0.95	0.77	2.87
27	Rubber Tree-Habitat	5.0	0.55	0.49	0.40	1.47
35	Balsa Tree-Habitat	5.0	0.55	0.53	0.37	1.70
69	Model of universe-Science Gallery	5.0	0.78	0.52	0.64	1.48
114	Counter area other-Biodiversity	5.0	0.35	0.14	0.42	0.50
4	Living with floods-Habitat Entrance	4.3	0.61	0.53	0.47	1.58
6	Giant Amg Rivers-Habitat Entrance	4.3	0.54	0.43	0.47	1.03
36	Rich life/Poor soil book-Habitat	4.3	0.62	0.26	0.61	0.97
112	Butterflies-Biodiversity	4.3	1.30	1.05	1.02	2.97
21	Caution sign for Habitat	3.6	0.32	0.19	0.23	0.62
56	Desk 2-Seminar room	3.6	0.72	0.32	0.85	1.00
58	Open shelf-Seminar room	3.6	0.44	0.29	0.42	0.77
64	Water fountain-Science Gallery	3.6	0.31	0.16	0.23	0.53
80	Oak leaf table-Science Gallery	3.6	3.39	1.33	3.80	5.05
220	Computer-Genetics	3.6	1.56	1.06	1.68	3.10
10	People snapshot panels-Habitat Entranc	2.9	0.96	1.09	0.59	2.55
42	Sandbox Tree/Supporting roles book-H	2.9	0.53	0.39	0.39	1.10
47	Glass panel-Bridge room	2.9	0.95	0.36	1.04	1.27
52	Pyramid display-Bridge room	2.9	0.69	0.51	0.51	1.43
60	Researcher bios-Seminar room	2.9	0.42	0.12	0.42	0.57
117	Poster/sign/case/board-Biodiversity	2.9	0.61	0.46	0.48	1.27

(cont.)

Table A.6 (cont.)  
Stops in the Amazonia Exhibition: Rank Order, by Percent of Visitors Who Stopped  
 (% of Visitors)

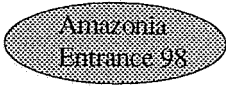
1	2	3	4	5	6	7
			Unique Stops: Statistics			
Location Description	Percent Who Stopped at Each Exhibit	Average time at stop (Minutes)	Standard Deviation	Median	Longest Stop	
118	Terrarium-Biodiversity	2.9	0.86	0.79	0.72	1.86
219	Hands-on (not micro)-Genetics	2.9	0.54	0.33	0.58	0.89
22	Landing/Dieffenbachia	2.2	0.32	0.09	0.27	0.42
37	Mystery mound-Habitat	2.2	0.46	0.23	0.55	0.62
39	Tree with red leaves-Habitat	2.2	1.30	1.52	0.52	3.05
57	Video-Seminar room	2.2	0.31	0.16	0.38	0.42
62	Free standing panel-Seminar room	2.2	0.70	0.56	0.63	1.30
66	Table-Science Gallery	2.2	1.40	1.84	0.35	3.53
72	Sit station 1-Science Gallery	2.2	3.42	2.87	2.05	6.72
116	Staff lab-Biodiversity	2.2	0.34	0.25	0.38	0.57
216	Staff lab-Genetics	2.2	0.72	0.28	0.72	1.00
217	Poster/sign/case/board-Genetics	2.2	0.38	0.09	0.42	0.45
316	Staff lab-Behavior	2.2	0.63	0.12	0.65	0.73
18	Blow gun-Field Station	1.4	0.74	0.72	0.74	1.25
20	Bench	1.4	1.09	0.79	1.09	1.65
23	Caution sign for animals	1.4	0.85	0.61	0.85	1.28
25	Monkey feeder-Habitat	1.4	0.35	0.17	0.35	0.47
59	Glass enclosed cases-Seminar room	1.4	0.32	0.21	0.32	0.47
61	Map-Seminar room	1.4	0.21	0.01	0.21	0.22
73	Bones station-Science Gallery	1.4	0.39	0.30	0.39	0.60
76	Tamarin poster 2-Science Gallery	1.4	0.72	0.52	0.72	1.08
215	Microscopes-Genetics	1.4	1.09	1.00	1.09	1.80
320	Computer-Behavior	1.4	1.38	1.34	1.38	2.33
321	Desk-Behavior	1.4	0.23	0.08	0.23	0.28
1	Into the river sign-Habitat Entrance	0.7	0.20	.	0.20	0.20
11	McIntyre photo panel-Habitat Entrance	0.7	0.40	.	0.40	0.40
51	Easel sign-Bridge room	0.7	1.92	.	1.92	1.92
55	Desk 1-Seminar room	0.7	0.23	.	0.23	0.23
65	Light Globe-Science Gallery	0.7	0.38	.	0.38	0.38
68	Video screen-Science Gallery	0.7	0.17	.	0.17	0.17
75	Sit station 2-Science Gallery	0.7	1.15	.	1.15	1.15
119	Hands-on (not micro)-Biodiversity	0.7	0.30	.	0.30	0.30

(cont.)

Table A.6 (cont.)  
Stops in the Amazonia Exhibition: Rank Order, by Percent of Visitors Who Stopped  
 (% of Visitors)

1	2	3	4	5	6	7
			Unique Stops: Statistics			
Location Description	Percent Who Stopped at Each Exhibit		Average time at stop (Minutes)	Standard Deviation	Median	Longest Stop
213	Pedigree game-Genetics	0.7	0.18	.	0.18	0.18
214	Counter area other-Genetics	0.7	0.52	.	0.52	0.52
218	Terrarium-Genetics	0.7	0.57	.	0.57	0.57
221	Desk-Genetics	0.7	0.28	.	0.28	0.28
319	Hands-on (not micro)-Behavior	0.7	0.37	.	0.37	0.37
322	Video-Behavior	0.7	0.22	.	0.22	0.22
416	Staff lab-Nutrition	0.7	0.88	.	0.88	0.88
417	Poster/sign/case/board-Nutrition	0.7	0.18	.	0.18	0.18
5	Pond desk-Habitat Entrance	0.0	.	.	.	.
46	Habitat exit	0.0	.	.	.	.
71	Tamarin poster 1-Science Gallery	0.0	.	.	.	.
77	Sit station 3-Science Gallery	0.0	.	.	.	.
78	Map station-Science Gallery	0.0	.	.	.	.
120	Computer-Biodiversity	0.0	.	.	.	.
121	Desk-Biodiversity	0.0	.	.	.	.
122	Video-Biodiversity	0.0	.	.	.	.
222	Video-Genetics	0.0	.	.	.	.
314	Counter area other-Behavior	0.0	.	.	.	.
315	Microscopes-Behavior	0.0	.	.	.	.
317	Poster/sign/case/board-Behavior	0.0	.	.	.	.
318	Terrarium-Behavior	0.0	.	.	.	.
414	Counter area other-Nutrition	0.0	.	.	.	.
415	Microscopes-Nutrition	0.0	.	.	.	.
418	Terrarium-Nutrition	0.0	.	.	.	.
419	Hands-on (not micro)-Nutrition	0.0	.	.	.	.
420	Computer-Nutrition	0.0	.	.	.	.
421	Desk-Nutrition	0.0	.	.	.	.
422	Video-Nutrition	0.0	.	.	.	.

APPENDIX B



id  interv  TIME  :  Count \_\_\_\_\_

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

1. Is today your first visit to this zoo?  
 Yes [Goto Q3]     No

1a. How many times have you been here before today? \_\_\_\_\_  q1atimes

1b. In the last year, how many times did you visit this zoo, before today? \_\_\_\_\_  q1btimes

2. Is today your first visit to this building?  
 Yes [Goto Q3]     No

2a. How many times have you been here before today? \_\_\_\_\_  q2atimes

2b. When was the last time you were here?  
 \_\_\_\_\_  /  q2blast

3. Did you make your decision to visit Amazonia before you arrived at the Zoo today, or after you arrived?  
 Before     After

4. What do you expect to see or do in this building?  
 [Mark all that apply.]

- See animals
- Watch animals being fed
- Watch videos of animals
- See a rainforest habitat
- Meet scientists/researchers
- See scientists at work
- Use scientific instruments
- Use computers
- See an exhib, with objects & text
- Read books/articles
- Buy something in a shop
- Amenities (restrooms/water/rest)
- Other: \_\_\_\_\_
- Don't know

8. On this card are some of the kinds of experiences that people have told us were satisfying to them in zoos. Which one comes closest to describing your most satisfying experience at the Zoo today? Your second choice? Your third choice?

- |                            | 1st                   | 2nd                   | 3rd                   |
|----------------------------|-----------------------|-----------------------|-----------------------|
| a. science activities      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. moved by beauty.        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. children learning       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. time w/friends/family   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| h. animals natural habitat | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| i. imagined times/places   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| k. enriched knowledge      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| l. precious life           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| m. recalled memories       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| n. connect natural world   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| p. interesting plants      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| s. spiritual connection    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| u. unusual fish            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| x. other                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

session	segment
<input type="text"/> <input type="text"/>	<input type="radio"/> 1
	<input type="radio"/> 2
card	<input type="radio"/> 3
<input type="radio"/> a	<input type="radio"/> 4
<input type="radio"/> b	<input type="radio"/> 5
<input type="radio"/> c	<input type="radio"/> 6
location	<input type="radio"/>
<input checked="" type="radio"/> Entrance	
<input type="radio"/> Hab. Exit	
<input type="radio"/> Gal. Exit	
status	
<input type="radio"/> Interview	
<input type="radio"/> SI staff	
<input type="radio"/> Inelig.	
<input type="radio"/> Ref: lang	
<input type="radio"/> Ref. other	

8a. Going back to your first choice, [letter]

- |  |  |
|--|--|
| a. Can you tell me more about that?                  | <input type="text"/> <input type="text"/>      |
| b. What was especially beautiful?                    |  |
| c. Can you give me an example?                       | <input type="text"/> <input type="text"/> q8a1 |
| f. NO PROBE  |  |
| h. Can you tell me more about that?                  |  |
| i. Can you tell me more about that?                  | <input type="text"/> <input type="text"/> q8a2 |
| k. Can you give me an example?                       |  |
| l. Can you tell me more about that?                  |  |
| m. What did you recall?                              | <input type="text"/> <input type="text"/> q8a3 |
| n. What in particular made you feel that connection? |  |
| p. What about the plants was especially interesting? | <input type="text"/> <input type="text"/> q8a4 |
| s. Can you tell me more about that?                  |  |
| u. Can you tell me more about that?                  |  |
| x. Other: Can you tell me more about that?           |  |

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id \_\_\_\_\_

9. Now I'm going to read you six statements. Using the scale on the other side of the card, for each statement that I read, please tell me the number that comes closest to how you feel. There are no right or wrong answers.

- |  |                       |                       |                       |                       |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| a. Human beings are the most important living things on earth.                     | 1                     | 2                     | 3                     | 4                     |
|  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| b. The basic ideas of science are too complex for most people to understand.       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| c. Taming the wild is a sign of progress.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| d. Most scientists want to work on things that will make the world a better place. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| e. Intelligence is the best measure of how valuable a species is.                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| f. The benefits of scientific research have outweighed the harmful results.        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

10. What are three words that you would use to describe scientists?

q10sci\_1

q10sci\_2

q10sci\_3

11. What are three words that you would use to describe scientific research?

q11sci\_1

q11sci\_2

q11sci\_3

12. Many professional people work behind the scenes at the Zoo. What do you think these people do?

Probe: Anything else? [Mark all that apply]

- Daily animal care
- Animal acquisition
- Education/public programs
- Exhibition development
- Research: breeding, end. species
- Research: animals (other)
- Research: environment
- Research: general/other
- Admin/operations
- Don't know
- Other: \_\_\_\_\_

Finally, I have just a few questions about you.

15. Have you ever visited the Smithsonian Museum of Natural History on the Mall? q15aNMNH

- Yes  No [Goto Q16]

15a. How many times have you been there? \_\_\_\_\_

16. Have you visited an exhibit about rainforests anywhere else? [Mark all that apply.]

- No  Yes Where?  Real rainforest
- Baltimore Aquarium  Bronx Zoo
  - New Orleans Aquarium  Other US \_\_\_\_\_
  - Philadelphia Zoo  Foreign

\*17. Where do you live?

- Washington, DC  Other US \_\_\_\_\_
- MD/VA suburbs  Foreign \_\_\_\_\_

statecity

\*18. Who are you here with today? [Code total group.]

- Alone  Adult(s) w/child(ren)/teens
- Two adults  Teens (13-17)
- 3+ adults  Tour group
- School group

[Goto Q19]

[Goto Q18a]

18a. What is/are the ages of the kids with you today?

[Under 18 only.] \_\_\_\_\_

\*19. What is your age? \_\_\_\_\_

age

20. Do you have any scientific or technical training? OR if visitor is in high school or younger: Does anyone in your family have scientific or technical training?

- Yes What kind?  No

q20

21. What kind of work do you do?

\_\_\_\_\_

occup

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

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

\*23. What is your cultural/racial/ethnic identity?

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

24. We might like to talk to you again about your visit.

Can we have your first name and a phone number where we would best be able to contact you at another time?

NAME: \_\_\_\_\_

NUMBER: ( ) \_\_\_\_\_

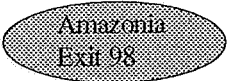
-    -

\*25. Mark gender:

- Female  Male



APPENDIX B



id       interv   TIME   :   Count \_\_\_\_\_

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

1. Is today your first visit to this zoo?  
 Yes [Goto Q3]     No

1a. How many times have you been here before today? \_\_\_\_\_    
 q1atimes

1b. In the last year, how many times did you visit this zoo, before today? \_\_\_\_\_    
 q1btimes

2. Is today your first visit to this building?  
 Yes [Goto Q3]     No

2a. How many times have you been here before today? \_\_\_\_\_    
 q2atimes

2b. When was the last time you were here?  
 \_\_\_\_\_   /   q2blast

3. Did you make your decision to visit Amazonia before you arrived at the Zoo today, or after you arrived?  
 Before     After

5. What did you find most interesting in this building? (Probes: What surprised you? What was most informative?) Why? [ Circle probes used.]

What?	<input type="text"/> <input type="text"/>
q5what	
Why?	<input type="text"/> <input type="text"/>
q5why	

6. HABITAT ONLY: Do you think this exhibition will influence the way you think about rainforests?  
 Yes    How?     No    Can you explain why not?

7. GALLERY ONLY: Do you think this exhibition will influence the way you think about biological research?  
 Yes    How?     No    Can you explain why not?

8. On this card are some of the kinds of experiences that people have told us were satisfying to them in zoos. Which one comes closest to describing your most satisfying experience in Amazonia today? Your second choice? Your third choice?

	1st	2nd	3rd
a. science activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. moved by beauty.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. children learning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. time w/friends/family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. animals natural habitat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. imagined times/places	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. enriched knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. precious life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. recalled memories	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. connect natural world	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
p. interesting plants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
s. spiritual connection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
u. unusual fish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
x. other	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

session	segment
<input type="text"/> <input type="text"/>	<input type="radio"/> 1
	<input type="radio"/> 2
card	<input type="radio"/> 3
<input type="radio"/> a	<input type="radio"/> 4
<input type="radio"/> b	<input type="radio"/> 5
<input type="radio"/> c	<input type="radio"/> 6
location	<input type="radio"/> 6
<input type="radio"/> Entrance	
<input type="radio"/> Hab. Exit	
<input type="radio"/> Gal. Exit	
status	
<input type="radio"/> Interview	
<input type="radio"/> SI staff	
<input type="radio"/> Inelig.	
<input type="radio"/> Ref: lang	
<input type="radio"/> Ref. other	

8a. Going back to your first choice, [letter]

- a. Can you tell me more about that?   q8a1
- b. What was especially beautiful?   q8a2
- c. Can you give me an example?   q8a3
- f. NO PROBE
- h. Can you tell me more about that?   q8a4
- i. Can you tell me more about that?
- k. Can you give me an example?
- l. Can you tell me more about that?
- m. What did you recall?
- n. What in particular made you feel that connection?
- p. What about the plants was especially interesting?
- s. Can you tell me more about that?
- u. Can you tell me more about that?
- x. Other: Can you tell me more about that?



APPENDIX B

id \_\_\_\_\_

9. Now I'm going to read you six statements. Using the scale on the other side of the card, for each statement that I read, please tell me the number that comes closest to how you feel. There are no right or wrong answers.

- a. Human beings are the most important living things on earth. 1   2   3   4  
 1    2    3    4

---

- b. The basic ideas of science are too complex for most people to understand. 1   2   3   4  
 1    2    3    4

---

- c. Taming the wild is a sign of progress. 1   2   3   4  
 1    2    3    4

---

- d. Most scientists want to work on things that will make the world a better place. 1   2   3   4  
 1    2    3    4

---

- e. Intelligence is the best measure of how valuable a species is. 1   2   3   4  
 1    2    3    4

---

- f. The benefits of scientific research have outweighed the harmful results. 1   2   3   4  
 1    2    3    4

10. What are three words that you would use to describe scientists?

q10sci\_1

q10sci\_2

q10sci\_3

11. What are three words that you would use to describe scientific research?

q11sci\_1

q11sci\_2

q11sci\_3

12. Many professional people work behind the scenes at the Zoo. What do you think these people do?

- Probe: Anything else? [Mark all that apply]
- Daily animal care
  - Animal acquisition
  - Education/public programs
  - Exhibition development
  - Research: breeding, end. species
  - Research: animals (other)
  - Research: environment
  - Research: general/other
  - Admin/operations
  - Don't know
  - Other: \_\_\_\_\_

13. Did you talk to a scientist in this building today?

- Yes                       No [Goto Q14]

13a. Where was this scientist?

- Habitat    In/near labs    Gallery - not labs

14. In this section of the building, did you notice any scientists working in a lab?

- Yes                       No

Finally, I have just a few questions about you.

15. Have you ever visited the Smithsonian Museum of Natural History on the Mall? q15aNMNH  
 Yes                       No [Goto Q16]

15a. How many times have you been there? \_\_\_\_\_

16. Have you visited an exhibit about rainforests anywhere else? [Mark all that apply.]  
 No    Yes   **Where?**    Real rainforest

- Baltimore Aquarium
- New Orleans Aquarium
- Philadelphia Zoo
- Bronx Zoo
- Other US \_\_\_\_\_
- Foreign

\*17. Where do you live?     
 Washington, DC    Other US \_\_\_\_\_  
 MD/VA suburbs    Foreign \_\_\_\_\_ statecity

\*18. Who are you here with today? [Code total group.]

<input type="radio"/> Alone <input type="radio"/> Two adults <input type="radio"/> 3+ adults	}	[Goto Q19]	<input type="radio"/> Adult(s) w/child(ren)/teens <input type="radio"/> Teens (13-17) <input type="radio"/> Tour group <input type="radio"/> School group	}	[Goto Q18a]
--	---	------------	--	---	-------------

18a. What is/are the ages of the kids with you today?

[Under 18 only.] \_\_\_\_\_

\*19. What is your age? \_\_\_\_\_ age

20. Do you have any scientific or technical training? OR if visitor is in high school or younger: Does anyone in your family have scientific or technical training?

- Yes   **What kind?**    No    
 \_\_\_\_\_ q20

21. What kind of work do you do? occup

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

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

\*23. What is your cultural/racial/ethnic identity?

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

24. We might like to talk to you again about your visit. Can we have your first name and a phone number where we would best be able to contact you at another time?

NAME: \_\_\_\_\_

NUMBER: (   ) \_\_\_\_\_  
   -    -

\*25. Mark gender:  
 Female    Male

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Appendix B  
Supplementary Tables

Table B.1

Gender, Age, and Racial/Ethnic Identity.

Reptile Discovery Center (RDC), National Museum of Natural History (NMNH), and Smithsonian (SI)  
Visitors 12 Years of Age or Older  
(In Percent)

	<i>Amazonia</i>		<i>Think Tank</i>		<i>RDC</i>	<i>NMNH</i>	<i>SI</i>
	<i>Entrance</i>	<i>Habitat</i>	<i>Gallery</i>	<i>Aug.Total</i>	<i>1992 Total</i>	<i>Aug. Total</i>	<i>Aug. Total</i>
<u>Gender</u>							
Female	56.0	37.3	60.3	55.2	53.8	51.2	49.1
Male	<u>44.0</u>	<u>62.7</u>	<u>39.7</u>	<u>44.8</u>	<u>46.2</u>	<u>48.8</u>	<u>50.9</u>
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
<u>Age</u>							
12 to 19	28.3	11.9	15.8	11.3	10.7	10.8	14.8
20 to 24	17.6	13.1	12.7	11.9	11.5	9.9	8.7
25 to 34	23.3	23.9	26.1	25.1	31.1	21.5	20.0
35 to 44	13.5	27.1	34.8	33.1	25.7	30.2	27.0
45 to 54	13.7	9.3	4.2	13.2	13.1	17.6	18.8
55 to 64	3.5	11.9	5.8	3.4	5.6	5.1	6.3
65 or older	<u>0.0</u>	<u>2.8</u>	<u>0.6</u>	<u>2.0</u>	<u>2.5</u>	<u>4.8</u>	<u>4.4</u>
Total	100.0	100.0	100.0	100.0	100.2	99.9	100.0
<u>Racial/Ethnic Identity--US Only</u>							
<b>Minority</b>	<b>29.6</b>	<b>23.5</b>	<b>16.3</b>	<b>23.1</b>	<b>16.3</b>	<b>23.2</b>	<b>19.5</b>
Afr. American/Black	6.8	8.1	2.1	13.3	7.9	5.8	5.5
Asian/Pacific Islander	8.8	3.4	7.3	4.0	4.7	10.2	8.5
Hispanic/Nat.							
Amer./Mult.	14.0	12.0	6.8	5.8	3.7	7.2	5.5
<b>White</b>	<b><u>70.3</u></b>	<b><u>76.5</u></b>	<b><u>83.8</u></b>	<b><u>76.9</u></b>	<b><u>83.8</u></b>	<b><u>76.9</u></b>	<b><u>80.5</u></b>
Total	99.9	100.0	100.1	100.0	100.1	100.1	100.0

Table B.2  
Geographic Origins and Racial/Ethnic Identification  
 Amazonia Science Gallery  
 Visitors 12 Years of Age or Older  
 (In Percent)

Racial/Ethnic Identity	<i>Washington, MD/VA</i>		<i>Other US</i>	<i>Foreign</i>	<i>Total</i>
	<i>D.C.</i>	<i>Suburbs</i>			
... Distribution by Racial/Ethnic Identity					
African American/Black	0.0	100.0	0.0	0.0	100.0
Asian/Pacific Islander	23.3	55.7	21.0	0.0	100.0
Hispanic	13.4	22.4	32.8	31.4	100.0
Nat. Amer./Multiple	0.0	0.0	100.0	0.0	100.0
White	2.2	35.8	57.5	4.5	100.0
... Distribution by Geography					
African American/Black	0.0	5.5	0.0	0.0	
Asian/Pacific Islander	39.0	10.6	2.7	0.0	
Hispanic	16.3	3.1	3.1	29.9	
Nat. Amer./Multiple	0.0	0.0	5.6	0.0	
White	<u>44.7</u>	<u>80.9</u>	<u>88.7</u>	<u>70.1</u>	
Total	100.0	100.0	100.0	100.0	

Table B.3  
Geographic Origins, Configuration of Group and Educational Attainment  
 Reptile Discovery Center (RDC), National Museum of Natural History (NMNH), and Smithsonian (SI)  
 Visitors 12 Years of Age or Older  
 (In Percent)

	<i>Amazonia</i>		<i>Think Tank</i>		<i>RDC</i>	<i>NMNH</i>	<i>SI</i>
	<i>Entrance</i>	<i>Habitat</i>	<i>Gallery</i>	<i>Total</i>	<i>1992 Total</i>	<i>Aug. Total</i>	<i>Aug. Total</i>
<u>Local Distribution</u>							
Washington, D.C.	5.4	6.6	4.2	7.9	8.2	3.9	4.1
MD/VA Suburbs	33.6	38.4	36.7	42.5	40.2	14.1	15.1
Other U.S.	55.5	49.0	53.8	45.6	44.3	69.6	68.8
Foreign	<u>5.6</u>	<u>6.1</u>	<u>5.3</u>	<u>4.0</u>	<u>7.2</u>	<u>12.4</u>	<u>11.9</u>
Total	100.0	100.0	100.0	100.0	99.9	100.0	99.9
<u>Configuration of Group</u>							
One adult	6.1	3.3	6.8	3.9	3.1	10.0	14.2
Two adults	22.6	31.4	28.5	20.7	19.9	18.9	23.6
Several adults	7.1	13.6	6.1	9.1	10.7	16.9	14.7
Adult(s) and child(ren)	59.4	51.3	58.0	64.5	61.7	51.9	43.2
School/Tour/Teens	<u>4.9</u>	<u>0.4</u>	<u>0.7</u>	<u>1.9</u>	<u>4.7</u>	<u>2.4</u>	<u>4.3</u>
Total	100.0	100.0	100.0	100.0	100.1	100.1	100.0
<u>Ages 25 or Older</u>							
High School or Less	16.9	14.6	20.8	19.4	19.0	20.1	17.9
AA/Jr. Coll./Some Coll.	17.1	41.5	23.2	20.3	24.3	21.9	19.8
Bachelor's/Some Graduate	22.5	30.3	29.3	35.0	33.9	29.6	35.4
MA/PhD/Professional	<u>43.4</u>	<u>13.6</u>	<u>26.8</u>	<u>25.4</u>	<u>22.8</u>	<u>28.5</u>	<u>26.9</u>
Total	100.0	100.0	100.0	100.0	100.0	100.1	100.0

## APPENDIX C.

### Methodology

This appendix briefly discusses how all of the studies were conducted, including the schedules for data collection, sample selection procedures, and completion rates.

#### OBSERVATION STUDY

Design. Data for this study were collected by unobtrusively observing visitors as they entered the Amazonia building. Data were collected during seven alternating days from June 18 to 30, 1998. Three sessions of observations were conducted on each day.

For this project we used a "continuous sampling" technique, a special procedure developed for sampling a mobile population.<sup>3</sup> We used teams of two or three people to track visitors. Observation was restricted to voluntary visitors; i.e., individuals clearly visiting the museum as part of a group were not selected for tracking.

Data collected included detailed information describing the path taken through the exhibition, locations stopped at, and activities engaged in, as well as some limited demographic information (gender, group composition, approximate age, and race/ethnicity by sight).

Sample Design and Selection. Observations were conducted every-other day and, within each day, there were three sessions (10:30 AM -12:00 PM, 1:15 PM - 2:45 PM, 3:00 PM – 4:30 PM).<sup>4</sup>

Sample selection followed procedures established by ISO for its studies.<sup>5</sup> Teams of three individuals – one acting as a team leader – collected data during each session. The team leader had two major responsibilities: (a) to count and record the number of people approaching the exhibition during 15-minute intervals, and (b) to identify individuals to be tracked. An imaginary line was selected near the interviewing location to clearly define who was approaching the exhibition. The team leader recorded the ongoing tally on a Sample Selection Form with the help of a mechanical counter and a watch. A tracker training manual was developed for the study.<sup>6</sup>

Smithsonian staff and contractors, members of formal tour or school groups, and people ineligible for the study because they were not making an Amazonia visit (e.g., looking for family or group members in the building) were excluded from the study. For

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<sup>3</sup> The procedure and its rationale are described in Z. D. Doering, A. E. Kindlon and A. Bickford, *The Power of Maps: A Study of an Exhibition at the Cooper-Hewitt National Museum of Design*. Report 93-5. (Washington, D. C.: Smithsonian Institution, 1993).

<sup>4</sup> The schedule is on file, ISO.

<sup>5</sup> This method of selecting a sample keeps the interviewers fully occupied, compared to an equal interval selection method; the counter is essentially incorporating a self-adjusting selection interval.

<sup>6</sup> On file at ISO.

logistical and technical reasons, observations were not conducted with members of school or tour groups. Thus, our data pertain to "voluntary visitors."

Implementation. One hundred thirty-nine systematically selected individuals were observed (unobtrusively tracked) from the time they entered the building until the time at which they left the building after viewing the Amazonia exhibition (but not entering the Science Gallery) or after visiting both the Amazonia exhibition and the Science Gallery. Observers (trackers) used specially designed maps and forms (see Appendix A) in conjunction with stopwatches to record the data.

A total of 114 exhibition elements were included in the observation protocol. An element was any area with contained animals or labeled plants (fish, cocoa tree), created artifacts (e.g. globe), or communication medium, such as a text panel, large photo, video loop, or interactive. The elements and sections of the exhibition identified by the exhibition team and the Institutional Studies Office and corroborated by NZP staff. The purpose of identifying the locations at which visitors stopped, and the time they spent at various elements, was to collect data that would aid in understanding how and where visitors spent their time in Amazonia and the Amazonia Science Gallery.

All stops made by visitors at any of the 114 exhibition elements were recorded. A "stop" was recorded if it was at least three seconds in duration. In addition to behavior, a few demographic characteristics were recorded from observations.

#### SURVEY OF ENTERING AND EXITING VISITORS

Overall Design. During a two-week survey period, August 10 to August 22, 1998, three groups of visitors (a total of 239 respondents) were selected for interviews: (a) those who entered the Amazonia building, (b) those who left the building after viewing the Amazonia exhibition but who did not enter the Science Gallery, and (c) those who left the building after visiting both the Amazonia exhibition and the Science Gallery. Data were collected in personal interviews, approximately 10 minutes in duration. Four interviewing sessions were conducted on each day.

As in the Tracking Study, the "continuous sampling" technique was used in this study.<sup>7</sup> Visitor cooperation with the study was high; a total of 239 interviews or 91% of eligible intercepted visitors completed interviews.

In preparation for the main study, preliminary interviews were conducted with about eighty visitors. As a result of these interviews, and after consultation with NZP staff, we developed the major topics for the questionnaire.

The questionnaire for the main study collected five types of information: characteristics of the individual, information about the visit, attitudes towards science, experience in the exhibition, and the satisfaction experienced during the visit. The questionnaire also

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<sup>7</sup> The procedure and its rationale are described in Z. D. Doering, A. E. Kindlon and A. Bickford, *The Power of Maps: A Study of an Exhibition at the Cooper-Hewitt National Museum of Design*. Report 93-5. (Washington, D. C.: Smithsonian Institution, 1993).

included a section for recording administrative information. This included the time, date and location of the interview, and the reason, if applicable, that an interview was not completed (e.g., Smithsonian employee). An interviewer training manual was developed for the study.<sup>8</sup>

Sample Design and Selection. Interviews were conducted every-other day and, within each day of the main study, there were three interviewing sessions (10:30 AM -12:00 PM, 1:15 PM - 2:45 PM, 3:00 PM – 4:30 PM.).<sup>9</sup> Sample selection procedures were identical to those described for the Tracking Study.

Data Preparation and Coding. The questionnaires were reviewed in the office to ensure that the data file included the appropriate information for weighting the data. Codes were developed for the open-ended items, e.g., responses to questions about science and scientists.

Completion Rates and Response Bias. Of the 263 individuals intercepted, 239 completed interviews (91%). Nine percent of people intercepted refused to participate in the survey. A few refusals (4%) were due to language difficulties, and the rest (5%) were for “other” reasons (e.g., visitors in a hurry, not wanting to detain companions, etc.).

To check for possible bias in the survey, we compared separate demographic characteristics available for both visitors who completed interviews and visitors who refused for any reason (from observations). These include, residence, age, gender, and racial/ethnic identification, and interview location. There were no significant differences between individuals interviewed upon entering the exhibition and those exiting.

### Interviews with Selected Families

On three days in late May and early June, 1998, 12 families who were seriously engaged in the Amazonia Science Gallery were interviewed in depth about their experience in the gallery and how it related to their lives and interests.

The interviews were conducted on three days during the busy summer season (May 27, June 11 and June 17, 1998). Families were selected for interviewing only after their behavior had been unobtrusively observed for some time and it seemed that they were seriously engaged in one or more elements of the Gallery. Interviews ranged in length from ten minutes to 30 minutes and were conducted with several family members together at the location in the Gallery where they were engaged.

After each interview fieldnotes were prepared which described the family, the setting in which the interview took place, what had been observed of the family's behavior before the interview began, and key points from the interview. The tape recording of each

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<sup>8</sup> General interviewing instructions were based on Institutional Studies, *A Manual for Interviewers*. Prepared for the 1988 National Air and Space Survey. Report 88-3. (Washington, D. C.: Smithsonian Institution, 1988). The general instructions and question-by-question specifications for this study are available from the Institutional Studies office.

<sup>9</sup> The schedule is on file, ISO.

interview was entered into the computer as a separate sound file.<sup>10</sup> Key moments in the interview were marked with identifying labels for further reference. Analysis consisted of repeated listening to important sections of the interviews, extended notes on individual interviews, and descriptions of patterns and differences.

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<sup>10</sup> Using MicNotePad for Macintosh.